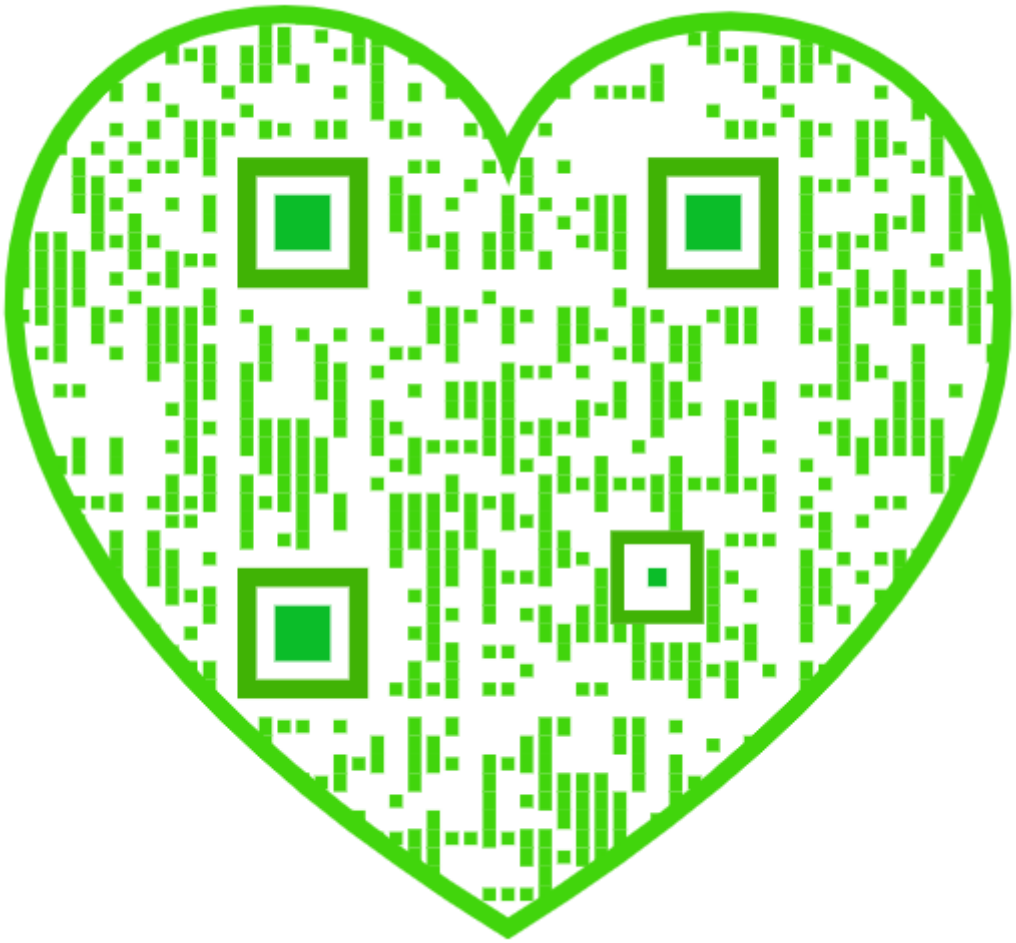


10

TRANSACTIONS

OF THE

AMERICAN ASSOCIATION

OF

OBSTETRICIANS (AND) GYNECOLOGISTS &

Abdomina
Surgeo

VOL. XXXII

FOR THE YEAR 1919

Edited by E. GUSTAV ZINKE, M.D., F.A.C.S.
Cincinnati

YORK
THE MAPLE PRESS
1920

428213
5.10.4

RG
1
A4
v. 32

COPYRIGHT, 1920

BY THE

AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS

All rights reserved

NOTE.

The Association does not hold itself responsible for the views enunciated in the papers and discussions published in this volume

DR. E. GUSTAV ZINKE, *Secretary*,
4 W. Seventh Avenue, Cincinnati.

[Minutes and discussions stenographically reported by William Whitford, Chicago, Ill.]

LIST OF ILLUSTRATIONS

	Page
Pneumatic Injector. (Robert Emmett Farr).	55– 59
Illustrates the Physiological Rise and Fall of Blood Pressures. (C. W. Moots and E. I. McKesson.)	64
Showing Production of and Relation Between Anesthesia and Analgesia. (Bertha Van Hoosen.)	77
Showing Method of Placing Sutures. (Wm. D. Porter.)	114
Lacerations of the Perineum. (A. Goldspohn.)	128–140
Adenomyoma of Ovary. (Otto H. Schwarz.)	232–241
Composite Drawing of Oviduct and Folds. (James E. Davis.)	244–278
"Buried Loop" Operation. (John Norval Bell.)	285–286
Abdominal Quadrant. (William Seaman Bainbridge.)	302–313
The Corpus Uteri. (H. W. Hewitt.)	390–393
Eclampsia; Blood-Pressure Charts. (James Knight Quigley.)	405–411
Syphiloma Vulvæ. (Arthur Stein)	422–429

CONTENTS

	Page
Constitution	xi
By-laws	xv
Officers for 1919–1920	xix
List of Officers	xxi
List of Honorary Fellows	xxiii
List of Honorary Fellows, Deceased	xxvii
List of Corresponding Fellows	xxix
List of Senior Fellows	xxxi
List of Ordinary Fellows	xxxiii
List of Ordinary Fellows, Deceased	liii
List of Ordinary Fellows, Classified	lv
Minutes of the Thirty-second Annual Meeting	lxi
President's Address. By John F. Erdmann, M.D.	1
Control of Venereal Disease in Detention Homes for Women. By Palmer Findley, M.D.	7
The Value of Detention as a Reconstruction Measure. By C. C. Pierce, M.D	9
Pioneering in Venereal Disease Control. By A. J. McLaughlin, M.D	21
Detention and Treatment of Infected Women as a Measure of Control of Venereal Diseases. By W. F. Draper, M.D.	27
Safety Factors in the Team Work of Operator and Anesthetist. By John J. Buettner, M. D.	45
Some Adjuncts which Promote Efficiency in the Use of Local Anesthesia. By Robert Emmett Farr, M.D	52
Surgical Barrage. By Charles W. Moots, M.D., and Elmer I. McKesson, M.D	60
The Advantages of Nitrous Oxid-oxygen in Labor. By Charles E. Turner, M.D.	69
Postoperative Analgesia. By Bertha Van Hoosen, M.D.	76
Prophylaxis of Gestation. By Asa B. Davis, M.D.	85
Prenatal Care. By Sylvester J. Goodman, M.D.	92
The Care of the Bowels During the Puerperal Period; A Further Report. By Ross McPherson M.D.	101
A Method of Placing Sutures in Immediate Repair of the Perineum. By Wm. D. Porter, M.D.	113
Median Episiotomy in Primiparous Labors. By James A. Harrar, M.D.	117
Repair of Partial and Complete Lacerations of the Perineum. By A. Goldspohn, M.D.	127
Observations on the Problem of Hemorrhage in Obstetrical Cases. By Arthur H. Bill, M.D.	145
My Experience with Cases Version During the Past Year. By Irving W. Potter, M.D.	152
Inversion of the Uterus. By H. Wellington Yates, M.D.	164
Cesarean Section; Its indications and Technic. By Arthur J. Skeel, M.D	171
Hot Flashes of Menopause. By K. I. Sanes, M.D.	181
The Cystic Ovary. By Francis Reder, M.D.	211
Chronic Oophoritis and the Cystic Ovary. By Otto H. Schwarz, M.D.	218
Case Reports. By Arthur T. Jones, M.D.	224
An Early Case of Adenomyoma of the Rectovaginal Septum and an Adenomyoma of the Ovary. By Otto H. Schwarz, M.D.	231
Protective Changes in the Oviduct. By James E. Davis, M.D.	243
The Treatment of Vaginal Discharge. By George Chandler, M.D.	279
The Buried Loop Operation for Shortening the Round Ligaments. By John Norval Bell, M.D.	284

PAGE

Clinical Facts Concerning the Stem-pessary. By THURSTON SCOTT WELTON, M.D 290
The Treatment of Peritonitis. By GEORGE W. CRILE, M.D. 296
A Study of Certain Bands in the Right Upper Abdominal Quadrant. By COMMANDER WILLIAM SEAMAN BAINBRIDGE, M.D. 301
Syphillis as a Cause of Delayed Healing in the Non-infected Abdominal Incision. By WM. EDGAR DARNALL, M.D. 318
Abscess of the Liver. By JOHN W. KEEFE, M.D. 324
Treatment of Gunshot Wounds of the Abdomen. By John D. S. Davis, M.D. 333
The Myenteric Nerve Net. By GORDON K. DICKINSON, M.D. 336
Short Incisions versus Long incisions. By ROBERT T. MORRIS, M.D. . . . 346
Some Lessons from the War for Abdominal Surgeons and Others. By ROLAND E. SKEEL, M.D. 349
Cancer Significance of Mammary Adenoma. By WILLIAM J. GILLETTE, M.D. 360
Cancer in Women. By ANDRÉ CROTTI, M.D. 365
Tumors of the Breast Based on a Study of Seventy-seven Cases. By MILES F. PORTER, M.D. 372
The Varieties and Treatment of Dysmenorrhea. By J. HENRY CARSTENS, M.D. 381
Congenital Absence of the Gall-bladder. By GASTON TORRANCE, M.D. . . 386
The Causal Relationship of Myomata to Carcinomata of the Corpus Uteri. By H. W. HEWITT, M.D. 388
Eclampsia: Is it Preventable? By KAMES KNIGHT QUIGLEY, M.D. . . . 395
Syphilioma Vulvæ. By ARTHUR STEIN, M.D. 413
The Rational Treatment of Fibromyomata Uteria. By STEPHEN E. TRACY, M.D. 432
In Memoriam. JULIUS H. JACOBSON, M. D. By CHARLES W. MOOTS, M.D. 441
In Memoriam. JULIUS H. JACOBSON, M.D. By E. GUSTAV ZINKE, M.D. 444
In Memoriam. JOHN ALEXANDER LYONS, M.D. By E. GUSTAV ZINKE, M.D. 446
In Memoriam. AUGUST ADRIAN STRASSER, M.D. By CHARLES L. ILL, M.D. 447

CONSTITUTION AND BY-LAWS

OF THE

AMERICAN ASSOCIATION

OF

OBSTETRICIANS AND GYNECOLOGISTS

TOGETHER WITH

MINUTES OF THE THIRTY-SECOND ANNUAL MEETING

AMERICAN ASSOCIATION

OF

OBSTETRICIANS AND GYNECOLOGISTS.

CONSTITUTION.

I. The name of this Association shall be THE AMERIEAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS.

II. Its object shall be the cultivation and promotion of knowledge in whatever relates to Abdominal Surgery, Obstetrics, and Gynecology.

MEMBERS.

III. The members of this Association shall consist of Ordinary Fellows, Honorary Fellows, Corresponding Fellows, and Senior Fellows.

The Ordinary Fellows shall not exceed one hundred and fifty in number.

The Honorary Fellows shall not exceed ten American and twenty-five foreign.

Candidates shall be proposed to the Executive Council at least one month before the first day of meeting, by two Fellows, and shall be balloted for at the annual meeting, a list of names having been sent to every Fellow with the notification of the meeting.

A two-thirds vote in the affirmative of all the members present shall be necessary to elect—fifteen Fellows at least being in attendance.

All candidates for active fellowship shall submit to the Executive Council, at least one month before the annual meeting, an original paper relating to Abdominal Surgery, Obstetrics, or Gynecology.

HONORARY FELLOWS.

IV. The power of nominating Honorary Fellows shall be vested in the Executive Council.

Their election shall take place in the same manner as that of Ordinary Fellows.

They shall enjoy all the privileges of Ordinary Fellows, excepting to vote or hold office, but shall not be required to pay any fee.

CORRESPONDING FELLOWS.

V. The Corresponding Fellows shall be recommended by the Executive Council and elected by the Association.

They shall enjoy all the privileges of Ordinary Fellows, excepting to vote or hold office, and shall be entitled to a copy of the annual TRANSACTIONS.

They shall pay an annual fee of five dollars.

SENIOR FELLOWS.

Senior Fellows shall be nominated by the Executive Council, and elected by the Association as provided for in the election of Honorary Fellows, and they shall enjoy the same privileges as are accorded Corresponding Fellows.

OFFICERS.

VI. The officers of this Association shall be a President, two Vice-Presidents, a Secretary, a Treasurer and six Executive Councillors.

The nomination of all officers shall be made in open session at the business meeting, and the election shall be by ballot.

The first five officers shall enter upon their duties immediately before the adjournment of the meeting at which they shall be elected, and shall hold office for one year.

"At the election next succeeding the adoption of these laws, the full number of Executive Councillors shall be elected; two for a term of three years, two for a term of two years, and two for a term of one year.

"At every subsequent election two Councillors shall be elected for a term of three years, and shall continue in office until their successors shall have been elected and shall have qualified."[1]

Any vacancy occurring during the recess may be filled temporarily by the Executive Council.

ANNUAL MEETINGS.

VII. The time and place of holding the annual meeting shall

[1] Amendment adopted September 21, 1898.

be determined by the Association or may be committed to the Executive Council each time before adjournment.

It shall continue for three days, unless otherwise ordered by vote of the Association.

AMENDMENTS.

VIII. This Constitution may be amended by a two-thirds vote of all the Fellows present at the annual meeting: *provided*, that notice of the proposed amendment shall have been given in writing at the annual meeting next preceding: and *provided, further*, that such notice shall have been printed in the notification of the meeting at which the vote is to be taken.

AMERICAN ASSOCIATION

OF

OBSTETRICIANS AND GYNECOLOGISTS.

BY-LAWS.

THE PRESIDING OFFICER.

I. The President, or in his absence, one of the Vice-Presidents shall preside at all meetings, and perform such other duties as ordinarily pertain to the Chair.

The presiding officer shall be *ex-officio* chairman of the Executive Council, but shall vote therein only in case of a tie.

SECRETARY.

II. The Secretary shall attend and keep a record of all meetings of the Association and of the Executive Council, of which latter he shall be *ex-officio* clerk, and shall be entitled to vote therein.

He shall collect all moneys due from the members, and shall pay the same over to the Treasurer, taking his receipt therefor.

He shall supervise and conduct all correspondence of the Association; he shall superintend the publication of the TRANSACTIONS under the direction of the Executive Council, and shall perform all the ordinary duties of his office.

He shall be the custodian of the seal, books, and records of the Association.

TREASURER.

III. The Treasurer shall receive all moneys from the Secretary, pay all bills, and render an account thereof at the annual meetings, when an Auditing Committee shall be appointed to examine his accounts and vouchers.

EXECUTIVE COUNCIL.

IV. The Executive Council shall meet as often as the interests of the Association may require. The President, or any three members may call a meeting, and a majority shall constitute a quorum.

It shall have the management of the affairs of the Association, subject to the action of the house at its annual meetings.

It shall have control of the publications of the Association, with full power to accept or reject papers or discussions.

It shall have control of the arrangements for the annual meetings, and shall determine the order of the reading of papers.

It shall constitute a court of inquiry for the investigation of all charges against members for offences involving law or honor; and it shall have the sole power of moving the expulsion of any Fellow.

ORDER OF BUSINESS.

V. The Order of Business at the annual meetings of the Association shall be as follows:

1. General meeting at 10 o'clock A. M.
   - *a*. Reports of Committees on Scientific Questions.
   - *b*. Reading of Papers and Discussion of the same.
2. One business Meeting shall be held at half-past nine o'clock A. M. on the first day of the session, and another on the evening of the second day (unless otherwise ordered by vote), at which only the Fellows of the Association shall be present. At these meetings the Secretary's record shall be read; the Treasurer's accounts submitted; the reports of Committees on other than scientific subjects offered; and all miscellaneous business transacted.

PAPERS.

VI. The titles of all papers to be read at any annual meeting shall be furnished to the Secretary *not later* than one month before the first day of the meeting.

No paper shall be read before the Association that has already been published, or that has been read before any other body.

Not more than thirty minutes shall be occupied in reading any paper before the Association.

Abstracts of all papers read should be furnished to the Secretary at the meeting.

All papers read before the Association shall become its sole property if accepted for publication; and the Executive Council may decline to publish any paper not handed to the Secretary *complete* before the final adjournment of the annual meeting.

QUORUM.

VII. The Fellows present shall constitute a quorum for all business, excepting the admission of new Fellows or acting upon amendments to the Constitution, when not less than fifteen Fellows must be present.

DECORUM.

VIII. No remarks reflecting upon the personal or professional character of any Fellow shall be in order at any meeting, except when introduced by the Executive Council.

FINANCE.

IX. Each Fellow, on admission, shall pay an initiation fee of twenty-five dollars, which shall include his dues for the first year.

Every Fellow shall pay, *in advance* (*i.e.*, at the beginning of each fiscal year) the sum of twenty dollars annually thereafter.

[A fiscal year includes the period of time between the first day of one annual meeting and the first day of the next.]

Any Fellow neglecting to pay his annual dues for two years may forfeit his membership, upon vote of the Executive Council.

The Secretary shall receive, annually, a draft from the President, drawn on the Treasurer, for a sum, to be fixed by the Executive Council, for the services he shall have rendered the Association during the year.

A contingent fund of one hundred dollars shall be placed annually at the disposal of the Secretary for current expenses, to be disbursed by him, and for which he shall present proper vouchers.

ATTENDANCE.

X. Any Fellow who shall neither attend nor present a paper for five consecutive years, unless he offers a satisfactory excuse, shall be dropped from fellowship, upon vote of the Executive Council.

RULES.

XI. *Robert's Rules of Order* shall be accepted as a parliamentary guide in the deliberations of the Association.

AMENDMENTS.

XII. These By-Laws may be amended by a two-thirds vote of the Fellows present at any meeting; *provided*, previous notice in writing shall have been given at the annual meeting next preceding the one at which the vote is to be taken.

OFFICERS FOR 1919–1920

PRESIDENT

GEORGE W. CRILE, Cleveland

VICE-PRESIDENTS

PALMER FINDLEY, Omaha
DAVID HADDEN, Oakland, Cal.

SECRETARY

E. GUSTAV ZINKE, Cincinnati

TREASURER

HERMAN E. HAYD, Buffalo

EXECUTIVE COUNCIL

AARON B. MILLER, Syracuse
JOHN W. KEEFE, Providence
CHARLES L. BONIFIELD, Cincinnati
ALBERT GOLDSPOHN, Chicago
JOHN F. ERDMANN, New York
HUGO O. PANTZER, Indianapolis

LIST OF OFFICERS.

From the Organization to the Present.

	President.	*Vice-Presidents.*	*Secretary.*	*Treasurer.*
1888.	Taylor, Wm. H.	Montgomery, E. E. Carstens, J. H.	Potter, Wm. W.	Werder, X. O.
1889.	Montgomery, E. E.	Myers, W. H. Banta, R. L.	Potter, Wm. W.	Werder, X. O.
1890.	Wright, A. H.	Rohé, G. H. Hall, R. B.	Potter, Wm. W.	Werder, X. O.
1891.	Vander Veer, A.	Hill, H. E. Morris, R. T.	Potter, Wm. W.	Werder, X. O.
1892.	McMurtry, L. S.	Ill, Ed. J. Longyear, H. W.	Potter, Wm. W.	Werder, X. O.
1893.	Rohé, Geo. H.	Manton, W. P. Hulbert, Geo. F.	Potter, Wm. W.	Werder, X. O.
1894.	Carstens, J. H.	Davis, W. E. B. Howitt, H.	Potter, Wm. W.	Werder, X. O.
1895.	Price, Joseph	Cordier, Al. H. Peck, G. S.	Potter, Wm. W.	Werder, X. O.
1896.	Ross, J. F. W.	Johnston, G. B. Sexton, J. C.	Potter, Wm. W.	Werder, X. O.
1897.	Reed, C. A. L.	Douglas, R. Dorsett, W. B.	Potter, Wm. W.	Werder, X. O.
1898.	Ill, Edward J.	Ricketts, Ed. Miller, A. B.	Potter, Wm. W.	Werder, X. O.
1899.	Hall, R. B.	Dunning, L. H. Crofford, T. J.	Potter, Wm. W.	Werder, X. O.
1900.	Davis, W. E. B.	Walker, Ed. Goldspohn, A.	Potter, Wm. W.	Werder, X. O.
1901.	Ricketts, E.	Cumston, C. G. Porter, M. F.	Potter, Wm. W.	Werder, X. O.
1902.	Dunning, L. H.	Rosenwasser, M. Hayd, H. E.	Potter, Wm. W.	Werder, X. O.
1903.	Dorsett, W. B.	Miller, A. B. Haggard, W. D.	Potter, Wm. W.	Werder, X. O.
1904.	Longyear H. W.	Gilliam, D. T. Brown, J. Y.	Potter, Wm. W.	Werder, X. O.
1905.	Brown, J. Y.	West, J. N. Simpson, F. F.	Potter, Wm. W.	Werder, X. O.
1906.	Morris, R. T.	Crile, G. W. Bonifield, C. L.	Potter, Wm. W.	Werder, X. O.
1907.	Zinke, E. G.	Keefe, J. W. Sellman, W. A. B.	Potter, Wm. W.	Werder, X. O.
1908.	Humiston, Wm. H.	Sadlier, J. E. Davis, J. D. S.	Potter, Wm. W.	Werder, X. O.
1909.	Miller, A. B.	Smith, C. N. Huggins, R. R.	Potter, Wm. W.	Werder, X. O.
1910.	Hayd, H. E.	Schwarz, H. Morris, L. C.	Potter, Wm. W.	Werder, X. O.
1911.	Werder, X. O.	Frank, L. Tate, M. A.	Zinke, E. G.	Hayd, H. E.
1912.	Porter, M. F.	Smith, C. N. Sadlier, J. E.	Zinke, E. G.	Hayd, H. E.

1913. Smith, C. N.	Pantzer, H. O. Branham, J. H.	Zinke, E. G.	Hayd, H. E.
1914. Bonifield, C. L.	Davis, A. B. Sanes, K. I.	Zinke, E. G.	Hayd, H. E.
1915. Pantzer, H. O.	Dickinson, G. K. Pfaff, O. G.	Zinke, E, G	Hayd, H. E.
1916. Keefe, J W.	Ill, Chas. L. Pfaff, Orange G.	Zinke, E. G.	Hayd, H. E.
1917. Goldspohn, A.	Bainbridge, W. S. Jones, A. T.	Zinke, E. G.	Hayd, H. E.
1918. Erdmann, J. F.	Weiss, E. A. Yates, H. W.	Zinke, E. G	Hayd, H. E.
1919. Crile. G. W.	Finley, P. Hadden, D.	Zinke, E. G.	Hayd, H. E.

HONORARY FELLOWS.

1899.—Ballantyne, John William, M.D., F.R.C.P.E., F.R.S. Edin. Lecturer on Midwifery and Gynecology, School of Medicine of the Royal Colleges, Surgeons' Hall, Edinburgh; Physician to the Royal Maternity Hospital, Edinburgh; formerly President of the Edinburgh Obstetrical Society; Examiner in Midwifery in the University of Edinburgh; Honorary Fellow of the Glasgow Obstetrical and Gynecological Society. 19 Rothesay Terrace, Edinburgh, Scotland.

1889.—Bantock, George Granville, M.D., F.R.C.S. Ed. Surgeon to the Samaritan Free Hospital. Broad Meadow, King's Norton, Birmingham, England.

1889.—Barbour, Sir A. H. Freeland, M.A., B.S.C., M.D. F.R.C.P. Ed., F.R.S. Ed. Lecturer on Midwifery and Diseases of Women in the Edinburgh Medical School; Assistant Physician to the Royal Maternity Hospital; Assistant Physician for Diseases of Women to the Royal Infirmary; Physician to the Women's Dispensary; Fellow of the Edinburgh and London Obstetrical Societies, and of the British Gynecological Society; Corresponding Fellow of the Royal Academy of Medicine, Turin. 4 Charlotte Square, Edinburgh, Scotland.

1889.—Croom, Sir J. Halliday, M.D., F.R.C.P.E., F.R.C.S.E., F.R.S.E. Professor of Midwifery in the University of Edinburgh; Consulting Physician to the Royal Infirmary; Physician to the Royal Maternity Hospital; late President of the Royal College of Surgeons, Edinburgh. 25 Charlotte Square, Edinburgh, Scotland.

1891.—Fernandez, Juan Santos, M.D. Prado, No. 105, Havana, Cuba.

1889.—Freund, William Alexander, M.D. Emeritus Professor and Director of the Clinic for Diseases of Women in the University of Strassburg. Kleiststrasse 9, Berlin W., Germany.

1912.—Gilliam, David Tod, M.D. Emeritus Professor of Gynecology, Starling-Ohio Medical College; Gynecologist to St. Anthony Hospital; Member of the American Medical Association, Ohio State Medical Association, Columbus Academy of Medicine; Honorary Member of the Northwestern Ohio Medical Association; Ex-president, Franklin County Medical Society; *Vice-president*, 1905. 333 East State Street, Columbus, Ohio.

1894.—Jacobs, Charles, M.D. Professor of the Faculty of Medicine of Brussels; Secretary-General of the Permanent Committee of the Periodic International Congress of Gynecology and Obstetrics; Honorary President of the Belgian Society of Gynecology and Obstetrics; Honorary Fellow of the Gynecological Societies of New York and Chicago; Member of the Southern Surgical and Gynecological Association; Corresponding Member of the Gynecological Society of Paris; Surgeon to the Brussels Polyclinic. 53 Boulevard de Waterloo, Brussels, Belgium.

1905.—McGraw, Theodore A., M.D. 73 Cass Street, Detroit, Mich.

1890.—Martin, August, M.D. Emeritus Professor of Gynecology in the University of Greifswald. Keithstrasse 14, Berlin W. 62, Germany.

1897.—Mathews, Joseph McDowell, M.D. Professor of Diseases of the Rectum and Clinical Surgery, Hospital College of Medicine; President of the Kentucky State Board of Health; President American Medical Association, 1899; 404 Consolidated Realty Bldg., Los Angeles, Cal.

1910.—de Ott, Dimitrij Oskarovic. Professor of Obstetrics and Gynecology in the Royal Pavloona Clinical Institute of St. Petersburg; President of the Fifth International Congress of Obstetrics and Gynecology. Wassily Ostrow, University Place, Petrograd, Russia.

1891.—Pietranera, E., M.D. Professor of Obstetrics in the Medical Department of the National University; Director of the Maternity Branch of the Clinical Hospital. 2711 Calle Rio Adaria, Buenos Ayres, Argentine Republic, S. A.

1889.—SCHULTZE, BERNHARD SIGMUND, M.D. Professor of Gynecology; Director of the Lying-In Institute and of the Gynecological Clinic. 2 Sellierstrasse, Jena, Germany.

1888.—WILLIAMS, SIR JOHN, BART., M.D., F.R.C.P. Blaen Llynant, Aberystwyth, Cardiganshire, Wales.

Total, fifteen Honorary Fellows.

HONORARY FELLOWS, DECEASED.

1892.—Boisliniere, L. Ch., A.B., M.D., L.L.D., Saint Louis, Mo., 1896.

1890.—Championniere, Just. Lucas, M.D., Paris, France, 1913.

1889.—Charpentier, Louis Arthur Alphonse, M.D., Paris. France, 1899.

1888.—Cordes, Auguste E., M.D., Geneva, Switzerland, 1914.

1890.—Corson, Hiram, M.D., Plymouth Meeting, Pa., 1896.

1889.—Dunlap, Alexander, A.M., M.D., Springfield, O., 1894.

1888.—Edis, Arthur Wellesley, M.D., Lond. F.R.C.S.· M.R.S.C.S., London, England, 1893.

1889.—Eklund, Abraham Fredrik, M.D., Stockholm, Sweden, 1898.

1891.—Fisher, George Jackson, A.M., M.D., Sing Sing, N. Y. 1893.

1896.—Gaston, James McFadden, A.M., M.D., Atlanta, Ga., 1903.

1892.—Green, Traill, M.D., LL.D., Easton, Pa., 1897.

1889.—Keith, Thomas, M.D., London, England, 1896.

1889.—Leopold, G., M.D., Dresden, Germany, 1913.

1894.—Maclein, Donald, M.D., Detroit, Mich., 1903.

1895.—Mastin, Claudius Henry, M.D., LL.D., Mobile, Ala., 1898.

1891.—Moses, Gratz Ashe, M.D., Saint Louis, Mo., 1901.

1905.—Myers, William Herschel, M.D., Fort Wayne, Ind., 1907.

1889.—Nicolaysen, Julius, M.D., Christiania, Norway, 1915.

1889.—Saenger, Max, M.D., Prague, 1903.

1890.—Savage, Thomas, M.D., F.R.C.S. Eng., Birmingham, England, 1907.

1890—Segond, Paul, M.D., Paris, France, 1913.

1899.—Sinclair, Sir William Japp, A.M., M.D., Manchester England, 1913.

1894.—Slaviansky, Kronid, M.D., St. Petersburg, Russia, 1898.

1888.—Smith, J. Greig, M.A., C.M., M.B., F.R.S.E., Bristol, England, 1897.

1896.—Sternberg, George Miller, A.M., M.D., LL.D. Washington, D. C., 1915.

1899.—Storrs, Melancthon, A.M., M.D., Hartford, Conn. 1900.

1888.—Tait, Lawson, M.D., LL.D., F.R.C.S.E., Birmingham, England, 1899.

1905.—Taylor, William Henry, M.D., *President*, 1888–1889, Cincinnati, Ohio, 1910.

1900.—Thornton, J. Knowsley, M.B., M.C., Cambridge, England, 1904.

1901.—Weber, Gustav C. E., M.D., LL.D., Willoughby, Ohio, 1912.

1889.—Von Winckel, F.M.D., Munich, Germany, 1912.

1905.—Wyman, Walter, M.D., Washington, D.C., 1911.

CORRESPONDING FELLOWS.

1899.—Beuttner, Oscar, M.D. Professor of the Faculty of Medicine; Directeur de la Clinique gynécologique et obstétricale de l'Université de Geneve. Maison Royale, 46, Quai des Eaux-Vives, Geneva, Switzerland.

1903.—Crozel, G., M.D. Professor Libre of Gynecology. Collonges au Mont d'Or, Chemin des Celestine, A Oullins, France.

1914.—Das, Kedarnath, M.D. Professor of Midwifery and Gynecology, Campbell Medical School; Obstetrician and Gynecologist, Campbell Hospital, Calcutta; Examiner in Midwifery and Gynecology, Calcutta University; Examiner in Midwifery, College of Physicians and Surgeons, Bengal; Fellow, Royal Society of Medicine, London. 22, Bethune Row, Calcutta.

1903.—Ellis, Guilherme, M.D. Chief Surgeon to the Real Sociedade de Beneficencia Portuguese Hospital. 6 Rua Aurora, S. Paulo, Brazil, S. A.

1891.—Griffin, Herbert Spohn, B.A., M.B., M.D., C.M. Surgeon to St. Joseph's Hospital; Gynecologist to Hamilton City Hospital; 157 Main Street, Hamilton, Ontario, Canada.

1914.—Hertoghe, Eugene, M.D. Antwerp, Belgium.

1903.—Lane, Horace Manley, M.D., LL.D. President of Mackenzie College, S. Paulo, Brazil. 184 Rua da Consolacao, S. Paulo, Brazil, S. A.

1891.—Machell, Henry Thomas, M.D., L.R.C.P. Ed. Lecturer on Obstetrics, Women's Medical College; Surgeon to St. John's Hospital for Women; Physician to Victoria Hospital for Sick Children and to Hillcrest Convalescent Home. 95 Bellevue Avenue, Toronto, Ontario, Canada.

1898.—Wright, Adam Henry, B.A., M.D. Univ. Toronto, M.R.C.S., Eng. Professor of Obstetrics in the University of Toronto; Obstetrician and Gynecologist to the Toronto General Hospital and Burnside Lying-in Hospital, *President*, 1891. 30 Gerrard Street, East, Toronto, Ont., Canada.

Total, nine Corresponding Fellows.

SENIOR FELLOWS.

1917.—Howitt, Henry, M.D., M.R.C.S. Eng., F.A.C.S. Senior Surgeon to the Guelph General and St. Joseph's Hospitals, Guelph. Member of the British, Canadian and Ontario Medical Associations. President of the Guelph Association. Vice-president, 1895. 221 Woolwich St., Guelph, Ontario, Canada.

1911.—Lincoln, Walter Rodman, B.A., M.D. Cocoa, Brevard County, Florida.

1919.—Lott, Henry Stokes, M.D. Member of Staff Attending Surgeons; Instructor of Nurses, Obstetrics and Gynecology, City Hospital. Residence, 810 West End Boulevard; Office, 308 Masonic Temple, Winston-Salem, North Carolina.

1915.—Lyons, John Alexander, M.D., F.A.C.S. Instructor in Gynecology at the Post-Graduate Medical School; Gynecologist and Lecturer to Nurses at the Chicago Hospital. Residence, 6348 Anthony Avenue; Office, 850 Wilson Avenue, Chicago, Ill.

1919.—Stanton, Byron, M.D. Consulting Obstetrician to Christ Hospital since 1888; Member of American Medical Association, American Public Health Association, Academy of Medicine of Cincinnati (Pres. 1903), Cincinnati Obstetrical Society (Pres. 1883); Member of Ohio State Board of Health, 1892 to 1909 (Pres. 1894, 1901, and 1908); Asst. Surg. 1st. Reg. Ohio Voluntary Light Artillery, 1861–2; Surgeon, 120th Ohio Voluntary Infantry, 1863–4; Surgeon, U. S. Vols., 1865; Superintendent, Ohio State Hospital, Cleveland, 1865–9. Residence, 6248 Savannah Avenue, Cincinnati, Ohio.

1917.—Sutcliffe, John Asbury, A.M., M.D., Capt., M.R.C., U. S. Army. Professor of Genito-urinary Surgery, Indiana University School of Medicine; Consulting Surgeon to St. Vincent's Infirmary; Consultant in Genito-urinary Diseases to the City Hospital and to the Protestant Deaconess' Hospital. Residence, 1121 Central Avenue; Office, 155 East Market Street, Indianapolis, Ind.

ORDINARY FELLOWS.

1895.—Bacon, Joseph Barnes, M.D., F.A.C.S. Professor of Rectal Diseases at the Post-Graduate Medical School; Instructor in Clinical Surgery in the Medical Department of Northwestern University, Chicago; Surgeon in Chief St. Francis Hospital, Macomb, Ill.

1911.—Bainbridge, William Seaman, M.D., A.M., LL.D., M.S., C.M., Sc.D., Commander, M.C., U.S.N. Adjunct Professor, New York Post-Graduate Medical School, 1902–6; Professor New York Polyclinic Medical School and Hospital since 1906; Surgeon, New York Skin and Cancer Hospital; Attending Surgeon, New York City Children's Hospitals and Schools; Consulting Surgeon, Manhattan State Hospital, Booth Memorial Hospital, Salvation Army Home and Hospital of New York City, College of Dental and Oral Surgery of New York, and Tarrytown Hospital, Tarrytown, N. Y.; Consulting Gynecologist, St. Andrew's Hospital (New York) and St. Mary's Hospital, Jamaica, Long Island and the Ossining Hospital, Ossining, N. Y.; Honorary President International Congress for Study of Tumors and Cancers, Heidelberg, Germany, 1906; *Vice-president*, 1917–1918. 34 Gramercy Park, New York City.

1895.—Baldwin, James Fairchild, A.M., M.D., F.A.C.S. Memb. Volunteer M.C.; Surgeon to Grant Hospital, 125 South Grant Avenue. Residence, 405 E. Town Street, Columbus, Ohio.

1903.—Bandler, Samuel Wyllis, M.D., F.A.C.S. Instructor in Gynecology in the New York Post-Graduate Medical School and Hospital; Adjunct Gynecologist to the Beth Israel Hospital. Residence and Office, 134 West Eighty-seventh Street, New York, N. Y.

1911.—Barrett, Channing W., M.D., F.A.C.S. Professor of Gynecology and Head of Division of Gynecology, University of Illinois Medical School, Gynecologist and Head of Department of Gynecology, Cook County Hospital. 561 Stratford Pl., Chicago, Ill.

1913.—Baughman, Greer, M.D., F.A.C.S., Capt., M.C., U. S. Army, Honorably Discharged. Professor of Obstetrics, Medical

College of Virginia; Visiting Obstetrician to the Stuart Circle Hospital, Virginia Hospital, and to the Memorial Hospital, Richmond, Virginia; Member of the Southern Surgical and Gynecological Association; Vice-president of the Medical Society of Virginia, 1905; President of the Richmond Academy of Medicine and Surgery, 1917; Member of the Tri-State Medical Association of Virginia and the Carolinas; Richmond Academy of Medicine and Surgery, Southern Medical Association and the American Medical Society. Residence and Office, 26 North Laurel St., Richmond, Virginia.

1907.—Bell, John Norval, M.D., F.A.C.S., Capt., M.C., U. S. Army. Associate Professor of Obstetrics, Detroit College of Medicine and Surgery; Attending Obstetrician, Harper Hospital; Consultant in Obstetrics, Woman's Hospital. Residence, 203 Pallister Avenue; Office, 1149 David Whitney Bldg., Detroit, Mich.

1914.—Bill, Arthur Holbrook, A.M., M.D., F.A.C.S. Associate Professor and Head of the Department of Obstetrics, School of Medicine, Western Reserve University; Obstetrician in Chief to the Maternity Hospital of Cleveland; Visiting Obstetrician and Department Head, Cleveland City Hospital; Director of the Out-Patient Obstetrical Department, Western Reserve University; Consulting Obstetrician to the Elyria Memorial Hospital, Elyria, Ohio. Residence, 1804 East Ninety-third Street; Office, 503 Osborn Building, Cleveland, Ohio.

1900.—Bonifield, Charles Lybrand, M.D. Professor of Gynecology, Medical Department of the University of Cincinnati. Member and Ex-President, Cincinnati Academy of Medicine, Cincinnati Obstetrical Society, Ohio State Medical Association and Ohio Clinical Association. Member of American Medical Association, Southern Surgical and Gynecological Society. *President*, 1914. Residence, 1763 East McMillan Street; Office, 409 Broadway, Cincinnati, Ohio.

1896.—Bosher, Lewis C., M.D., F.A.C.S. Emeritus Professor of Genito-Urinary Surgery, and Practice of Surgery, Medical College of Virginia; Visiting Surgeon to Stuart Circle Hospital and Memorial Hospital. Residence and Office, 422 East Franklin Street, Richmond, Virginia.

Founder.—Boyd, James Peter, A.M., M.D. Emeritus Professor of Obstetrics and Diseases of Children in the Albany Medical College; Consulting Obstetrician and Gynecologist to the Albany Hospital; Fellow of the British Gynecological Society; Fellow of the Royal Society of Medicine. 152 Washington Avenue, Albany, N. Y.

1889.—Branham, Joseph H., M.D. Professor of Surgery in the Maryland Medical College; Surgeon to the Franklin Square Hospital. 2200 Eutaw Place, corner Ninth Avenue, Baltimore, Md.

1912.—Brown, George Van Amber, M.D. Gynecologist to Providence Hospital; Clinical Instructor in Gynecology, Detroit College of Med. and Surg.; Member Wayne Co. and Michigan State Med. Soc.; Member American Medical Association; President Northern Tri-State Med. Soc. 1918. Residence, 55 Gladstone Avenue; Office, 919 J. Henry Smith Building, Detroit, Mich.

1914.—Brown, William Mortimer, M.D., F.A.C.S. Obstetrician to Rochester General Hospital. Residence and Office, 1776 East Ave., Rochester, N. Y.

1918.—Burckhardt, Louis, M.D. Professor of Obstetrics, Indiana University. Residence, 3159 North Pennsylvania Street; Office, 621 Hume-Mansur Building, Indianapolis, Ind.

1908.—Buteau, Samuel H., M.D., F.A.C.S. Former member of California State Board of Medical Examiners; formerly Visiting Surgeon to Almeda County Hospital. Residence, 1052 Telegraph Avenue; Office, 1155 Broadway, Oakland, Cal.

Founder.—Carstens, J. Henry, M.D., F.A.C.S., Maj., M.R.C. U. S. Army. Professor Abdominal and Pelvic Surgery, Detroit College of Medicine and Surgery, President of the Faculty. Consulting Gynecologist to the Harper Hospital; Cons. Obstetrician to the Woman's Hospital; Consulting Obstetrician to the House of Providence; Ex-President Michigan State Medical Society; Ex-President Mississippi Valley Medical Society; Ex-Chairman Section of Obstetrics, A. M. A.; Member Royal Society of Medicine; Member American College of Surgeons, etc., etc. President of the Detroit Gynecological Society, 1892. *Vice-president*, 1888–89; *President*, 1895; *Executive Council*, 1896–98. 1447 David Whitney Building, Detroit, Mich.

1914.—Chandler, George Fletcher, M.D., F.A.C.S., Maj., M.C., U. S. Army. Surgeon to the Kingston City Hospital. Residence and Office, 11 East Chestnut St., Kingston, N. Y.

1915.—Clark, Edmund Dougan, M.D., F.A.C.S. Professor of Surgery and Secretary of the Faculty, Indiana University School of Medicine. Residence, 1236 New Jersey Street; Office, Hume-Mansur Building, Indianapolis, Ind.

1901.—Crile, George W., A.M., M.D., F.A.C.S., Maj., M.C., U. S. Army. Senior Consultant in Surgical Research, American Expeditionary Forces; Professor of Surgery, Western Reserve Medical College; Visiting Surgeon to Lakeside Hospital. *Vice-president*, 1907. Residence, 2620 Derbyshire Road, Cleveland Heights; Office, Osborn Bldg., Cleveland, Ohio.

1905.—Crossen, Harry Sturgeon, M.D., F.A.C.S. Clinical Professor of Gynecology in Washington University; Gynecologist to Washington University Hospital; Associate Gynecologist to Mullanphy Hospital; Consulting Gynecologist to Bethesda, City and Female Hospitals. Residence, ~~4477 Delmar Avenue;~~ Office, 310 Metropolitan Building, Saint Louis, Mo. 5023 Bartmer

1912.—Crotti, André, M.D., F.A.C.S. Capt., M.C., U. S. Army. Professor of Clinical Surgery, Ohio State University; Surgeon to Grant Hospital, Children's Hospital and to St. Francis Hospital. Residence, 1728 E. Broad Street; Office, 151 E. Broad Street, Columbus, Ohio.

1912.—Darnall, William Edgar, A.B., M.D., F.A.C.S. Gynecologist, Atlantic City Hospital; Consulting Surgeon to North American Children's Sanitarium for the Treatment of Surgical Tuberculosis, and Home for Incurables, Longport, New Jersey. *Vice-president* American Medical Association, 1914. Residence and Office, 1704 Pacific Ave., Atlantic City, N. J.

1911.—Davis, Asa Barnes, M.D., F.A.C.S. Attending Surgeon of the Society of the Lying-in Hospital of the City of New York; Consulting Gynecologist to the Vassar Brothers' Hospital, Poughkeepsie, N. Y. 42 E. 35th Street, New York.

1915.—Davis, James Ethelbert, A.M., M.D. Professor of Pathology, Detroit College of Medicine and Surgery; Director of Laboratories, Providence Hospital and Woman's Hospital; Attending Gynecologist, Providence Hospital; Chief of Staff, William Booth Memorial Hospital. Residence, 58 Hague Avenue; Office, 1229 David Whitney Building; Detroit, Michigan.

1903.—Davis, John D. S., M.D., LL.D., F.A.C.S. Professor of Surgery in the Post-Graduate School of Medicine of the University of Alabama; Surgeon to Hillman Hospital; Surgeon to Davis Infirmary; ex-President Jefferson County Medical Society; *Vice-president*, 1905; *Vice-president*, 1909. 2031 Avenue G, Birmingham, Ala.

1910.—Dice, William Gordon, A.B., M.D. Obstetrician to Flower Hospital. 240 Michigan Street, Toledo, Ohio.

1909.—Dickinson, Gordon K., M.D., F.A.C.S. Surgeon to the City and Christ Hospitals; Consulting Surgeon to Bayonne Hospital. Consulting Surgeon, Stumpf Memorial Hospital, Kearny, N. J. 280 Montgomery Street, Jersey City, N. J.

1904.—Elbrecht, Oscar H., Ph.B., M.D., F.A.C.S. Formerly Superintendent and Surgeon in Charge, St. Louis Female Hospital; Visiting Surgeon, St. Louis City Hospital; Consulting Gynecologist, Missouri Pacific Hospital; Consulting Surgeon to St. Louis Maternity Hospital and former Chief of Staff; Consulting Surgeon, Bethesda Hospital; Member of Southern Surgical and Gynecological Association. Residence, Buckingham Hotel; Office, 423 Metropolitan Building, St. Louis, Mo.

1906.—Erdmann, John Frederick, M.D., F.A.C.S. Professor of Surgery, N. Y. Post-Graduate Hospital and Medical School; Attending Surgeon to Gouverneur Hospital and Post-Graduate Hospital; Consulting Surgeon to St. John's Riverside Hospital, Yonkers, N. Y.; Mt. Vernon General Hospital, Mt. Vernon, N. Y.; Greenwich General Hospital, Greenwich, Conn.; Nassau Hospital, Mineola, L. I. 60 West Fifty-second Street, New York, N. Y.

1911.—Findley, Palmer, B.E., M.D., F.A.C.S. Professor of Gynecology, College of Medicine, University of Nebraska. 418 Brandeis Theater Building, Omaha, Neb.

1910.—Foster, Curtis Smiley, A.B., M.D., F.A.C.S. Gynecologist to the Western Pennsylvania Hospital, Pittsburgh. Residence, 5749 Ellsworth Avenue; Office, 308 Diamond Bank Building, Pittsburgh, Pa.

1903.—Frank, Louis, M.D., F.A.C.S. Professor of Abdominal and Pelvic Surgery, Medical Department, University of Louisville; Surgeon Louisville City Hospital; Surgeon to John N. Norton Memorial Infirmary; President Mississippi Valley Medical Association, 1912; *Executive Council*, 1913. Residence, 1321 Fourth Ave.; Office, 400 The Atherton, Louisville, Kentucky.

1912.—Furniss, Henry Dawson, M.D., F.A.C.S., Capt., M.C., U. S. Army; Professor of Gynecology, New York Post-Graduate Hospital; Attending Gynecologist New York Post-Graduate Medical School and Hospital; Consulting Gynecologist, Volunteer Hospital;

Consulting Gynecologist, New Rochelle Hospital; Consulting Gynecologist, St. Agnes Hospital, White Plains, N. Y.; Fellow, New York Academy of Medicine, New York Medico-Surgical Society, New York Obstetrical Society, New York State and County Medical Societies, American Medical Association, American Urological Society. Residence, 393 West End Ave.; Office, 54 East Forty-eighth Street, New York, N. Y.

1902.—GILLETTE, WILLIAM J., M.D. Professor of Abdominal Surgery and Gynecology in the Toledo Medical College; Surgeon to Robinwood Hospital. 1613 Jefferson Street, Toledo, Ohio.

1895.—GOLDSPOHN, ALBERT, M.S., M.D., F.A.C.S. Professor of Gynecology, Post-Graduate Medical School; Surgeon in Chief of Evangelical Deaconess Hospital. *Vice-president*, 1901. Residence, 2118, Office, 2120 Cleveland Avenue, Chicago, Ill.

1912.—GOODMAN, SYLVESTER JACOB, Ph.G., M.D., F.A.C.S. Surgeon and Obstetrician to Grant Hospital. Residence, 1718 Franklin Avenue; Office, 121 South Sixth Street, Columbus, Ohio.

1913.—HADDEN, DAVID, B.S., M.D., F.A.C.S. Residence, 6150 Mendocino Ave.; Office, Oakland Bank of Savings Bldg., Oakland, Cal.

1900.—HAGGARD, WILLIAM DAVID, JR., M.D., F.A.C.S. Professor of Gynecology, Medical Department University of Tennessee; Professor of Gynecology and Abdominal Surgery, University of the South (Sewanee); Gynecologist to the Nashville City Hospital; President of the Nashville Academy of Medicine; Secretary of the Section on Diseases of Women and Obstetrics, American Medical Association, 1898; Fellow (and President) of the Southern Surgical and Gynecological Association; Member of the Alumni Association of the Woman's Hospital, N. Y. *Vice-president*, 1904. 148 Eighth Avenue, North, Nashville, Tenn.

1906.—HALL, JOSEPH ARDA, M.D., F.A.C.S., Lieut. Col., M.C., U. S. Army. Clinical Assistant in Gynecology at the Miami Medical College, Cincinnati. 628 Elm Street, Cincinnati, Ohio.

1889.—HALL, RUFUS BARTLETT, A.M., M.D., F.A.C.S. Professor of Clinical Gynecology in the Ohio-Miami Medical College, Medical Department of University of Cincinnati; Gynecologist to the Cincinnati Hospital; Surgeon in charge of the Hall Hospital; Member of the British Medical Society; of the Southern Surgical and

Gynecological Association; of the American Medical Association; of the Ohio State Medical Society (President, 1900); of the Cincinnati Academy of Medicine (President, 1909); of the Cincinnati Obstetrical Society (Ex-President). *Vice-president*, 1891; *President*, 1900; *Executive Council*, 1904–1909. Berkshire Building, 628 Elm Street, Cincinnati, Ohio.

1902.—Hamilton, Charles Sumner, A.B., M.D., F.A.C.S. Professor of the Principles of Surgery in Starling Medical College; Surgeon to Mt. Carmel and the Children's Hospitals. 142 South Garfield Street, Columbus, Ohio.

1910.—Harrar, James Aitken, M.D., F.A.C.S. Attending Surgeon to the Lying-in Hospital of the City of New York. Residence and Office, 108 East 64th Street, New York, N. Y.

1894.—Hayd, Herman Emil, M.D., M.R.C.S. Eng., F.A.C.S. Surgeon to the German Deaconess Hospital; Surgeon to the German Hospital. *Vice-president*, 1903; *Executive Council*, 1908–1910; *President*, 1911. 493 Delaware Avenue, Buffalo, N. Y.

1908.—Hedges, Ellis W., A.B., M.D., F.A.C.S. Visiting Surgeon to Muhlenberg Hospital, Plainfield, N. J. 703 Watchung Avenue, Plainfield, N. J.

1919.—Hewitt, Herbert Windham, M.D. Attending Surgeon, Grace Hospital; Attending Surgeon, Children's Free Hospital; Associate Professor of Clinical Surgery, Detroit, College of Medicine. Residence, 79 Rowena Street; Office, 1131 David Whitney Bldg., Detroit, Michigan.

1910.—Hill, Ira Leon, A.B., M.D. Clinical Instructor of Obstetrics at Cornell University Medical College; Visiting Obstetrician to the Red Cross Hospital; Attending Obstetrician to Sydenham Hospital. 616 Madison Avenue, New York, N. Y.

1905.—Huggins, Raleigh Russell, M.D., F.A.C.S. Surgeon to St. Francis Hospital. *Vice-president*, 1910. 1018 Westinghouse Building, Pittsburgh, Pa.

1895.—Humiston, William Henry, M.D. Clinical Professor of Gynecology in the Medical Department of Western Reserve University; Gynecologist in Chief to St. Vincent's Charity Hospital; Consulting Gynecologist to the City Hospital; President of the Ohio State Medical Society, 1898. *Executive Council*, 1902–1903, 1908, 1910–1911. *President*, 1909. Residence, 2041 East Eighty-ninth Street; Office, 536 Rose Building, Cleveland, Ohio.

1901.—Ill, Charles L., M.D., F.A.C.S. Surgeon to the German Hospital; Gynecologist to St. Michael's and Surgeon to St. Barnabas's Hospitals; Newark; Gynecologist to All Souls' Hospital, Morristown. 188 Clinton Avenue, Newark, N. J.

Founder.—Ill, Edward Joseph, M.D., F.A.C.S. Surgeon to the Woman's Hospital; Medical Director of St. Michael's Hospital; Gynecologist and Supervising Obstetrician to St. Barnabas's Hospital; Consulting Gynecologist to the German Hospital and the Bnoth Israel Hospital of Newark, N. J., to All Souls' Hospital, Morristown, N. J., and to the Mountain Side Hospital, Montclair, N. J.; Member of the Southern Surgical and Gynecological Association; Vice-president from New Jersey of the Pan-American Medical Congress of 1893; President of the Medical Society of the State of New Jersey, 1907. *Vice-president*, 1893; *President*, 1899; *Executive Council*, 1901–1903. 1002 Broad Street, Newark, N. J.

1906.—Jonas, Ernst, M.D., F.A.C.S. Clinical Professor of Surgery in Washington University Medical School; Surgeon in Charge of the Surgical Clinic at the Washington University Hospital; Gynecologist to the St. Louis Jewish Hospital; Visiting Surgeon to St. Louis City Hospital; Consulting Surgeon to St. John's Hospital; Surgeon to the Martha Parsons Free Hospital for Children. Residence, 4495 Westminster Place; Office, 465 North Taylor Avenue, St. Louis, Mo.

1910.—Jones, Arthur Thoms, M.D., F.A.C.S. Visiting Surgeon to Memorial Hospital, Pawtucket, R. I. and to Rhode Island State Hospital for the Insane, Howard, R. I.; Consulting Surgeon to St. Joseph's Hospital, Providence; and to Woonsocket Hospital, Woonsocket, R. I. Residence, 81 Elm Grove Avenue; Office, 131 Waterman St., Providence, R. I.

1902.—Keefe, John William, M.D., L.L.D., F.A.C.S. Attending Surgeon to the Rhode Island Hospital and Providence City Hospital; Consulting Surgeon to the St. Joseph's Hospital, Providence Lying-In Hospital, Memorial Hospital, Pawtucket and Woonsocket Hospital. *Vice-president*, 1908. *Executive Council*, 1911. 262 Blackstone Boulevarde, Providence, R. I.

1910.—Kennedy, James W., M.D., F.A.C.S. Associate Gynecologist and Obstetrician to the Philadelphia Dispensary. 1409 Spruce Street, Philadelphia, Pa.

1911.—King, James E., M.D., F.A.C.S. Professor of Clinical Gynecology, Medical Department, University of Buffalo, New York; Attending Gynecologist, Buffalo General and Erie County Hospital and Good Samaritan Dispensary; Fellow Royal Society of Medicine, London, England; Fellow of Am. Gyn. Soc. 1248 Main Street, Buffalo, N. Y.

1908.—Kirchner, Walter C. G., A.B., M.D., F.A.C.S., Capt., M.C., U. S. Army. Formerly Superintendent and Surgeon in charge of the St. Louis City Hospital. Visiting Surgeon City Hospital, Consulting Surgeon St. John's Hospital. Office, 508 Metropolitan Building, St. Louis, Mo.

1918.—Kosmak, George William, A.B., M.D., F.A.C.S. Attending Surgeon, New York Lying-in Hospital; Editor, American Journal of Obstetrics, and Bulletin of New York Lying-in Hospital. Residence and Office, 23 East Ninety-third Street, New York, N. Y.

1898.—Langfitt, William Sterling, M.D., F.A.C.S. Surgeon in chief to St. John's Hospital. Office, 8047 Jenkins Building, Pittsburgh, Pa.

1914.—Leighton, Jr., Adam P., L.M. (Dublin), M.D. Attending Obstetrician to Dr. Leighton's Maternity Hospital, Portland; Gynecologist to Edward Mason Dispensary, Portland; Chairman of the Maine State Board of Registration of Medicine; Consulting Obstetrician to the Webber Hospital, Biddeford; Consulting Obstetrician to the Gardiner General Hospital, Gardiner. Residence, 261 Western Promenade; Office, 192 State Street; Private Hospital, 109 Emery Street, Portland, Maine.

1915.—Litzenberg, Jennings, A.B., M.D., F.A.C.S. Professor of Gynecology and Obstetrics, University of Minnesota. Residence, 3137 Park Avenue; Office, Donaldson Building, Minneapolis, Minn.

1890.—Longyear, Howard Williams, M.D., F.A.C.S. Professor of Gynecology and Abdominal Surgery in the Detroit Post-Graduate Medical School; Clinical Professor of Gynecology in the Detroit College of Medicine; Gynecologist to Harper Hospital; Physician to the Woman's Hospital; President of the Detroit Gynecological Society, 1889; President of the Detroit Surgical Society; Chairman of the Section on Obstetrics and Gynecology of the Michigan State Medical Society, 1892; Chairman Section of Obstetrics and Gyne-

cology and Abdominal Surgery of the American Medical Association 1917. *Vice-president*, 1893; *President*, 1905; *Executive Council*, 1906–1908. Residence, 1699 Jefferson Avenue; Office, 32 Adams Avenue W., Detroit, Mich.

1911.—Lothrop, Earl P., A.B., M.D., F.A.C.S. Gynecologist to the Buffalo Woman's Hospital; Consulting Surgeon to Columbus Hospital, Buffalo; Surgeon to the J. N. Adam Memorial Hospital for Tuberculosis, Perrysburg, N. Y. 153 Delaware Avenue, Buffalo, N. Y.

1913.—Lynch, Jerome Morley, M.D., F.A.C.S. Professor Rectal and Intestinal Diseases, New York Polyclinic; Consulting Surgeon Nassau Hospital, Mineola, L. I.; Attending Surgeon St Mary's Hospital, Hoboken, N. J.; Member New York State and County Societies, American Medical Association, American Proctologic Society, North Western Medical and Surgical Society; Surgeon Medical Reserve, U. S. N. Residence and Office, 57 East Fifty-second St., New York City.

1910.—McClellan, Benjamin Rush, A.B., A.M., M.D., F.A.C.S. Capt., M.C., U. S. Army, Member American Medical Association; ex-President Ohio State Medical Society; Surgeon to McClellan Hospital. Residence, 636 South Detroit Street; Office, 7 East Second Street, Xenia, Ohio.

1910.—McPherson, Ross, A.B., M.D., F.A.C.S. Attending Surgeon of the Lying-in Hospital of the City of New York; Consulting Obstetrician of the Caledonian Hospital in Brooklyn. Office, 125 East Thirty-ninth Street; Residence, 45 East Sixty-second Street, New York, N. Y.

Founder.—Manton, Walter Porter, M.D., F.A.C.S. Head of Department and Professor of Obstetrics and Clinical Gynecology, Detroit College of Medicine and Surgery; Gynecologist to Harper Hospital and the Pontiac and Traverse City State Hospitals; Consulting Gynecologist to St. Joseph's Retreat; Formerly President of the Medical Board and Visiting Obstetrician Woman's Hospital and Infants' Home; President Detroit Academy of Medicine, 1892–1894; President Detroit Gynecological Society, 1890; President Wayne County Medical Society, 1908–1909; Chairman, Section on Obstetrics and Diseases of Women, 1909; Fellow of the Royal Medical Society, the American Gynecological Society, the American

College of Surgeons; the Zoological Society of London, etc. *Vice-president*, 1894. 32 Adams Avenue, W., Detroit, Mich.

1911.—Marvel, Emery, M.D., F.A.C.S. Chief Surgeon and Gynecologist, Private Hospital Association, Atlantic City; Consulting Surgeon and Gynecologist, Jewish Seashore Home, Atlantic City, 1801 Pacific Avenue, Atlantic City, N. J.

1914.—Meeker, Harold Denman, A.B., M.D., Lieut. Com., M.C., U. S. N. Adjunct Professor of Surgery, Polyclinic Medical School and Hospital, New York; Visiting Surgeon to New York Red Cross Hospital. Residence and Office, 420 West End Avenue, New York, N. Y.

Founder.—Miller, Aaron Benjamin, M.D., F.A.C.S. Professor of Gynecology in the Medical Department of Syracuse University; Gynecologist to St. Joseph's Hospital; Consulting Gynecologist to Hospital for Women and Children; Gynecologist to Dispensary. *Vice-president*, 1899, 1904; *President*, 1910; *Executive Council*, 1911. 326 Montgomery Street, Syracuse, N. Y.

1905.—Miller, John D., M.D., F.A.C.S. Professor of Gynecology, University of Cincinnati; Director of Gynecologic Clinic (Out-patient's Dept.), Cincinnati General Hospital; Gynecologist of Good Samaritan and Cincinnati General Hospitals. Residence, N. E. cor. Clifton and McMillan Streets; Office, N. W. cor. Eighth and Elm Streets, Cincinnati, Ohio.

1911.—Moots, Charles W., B.S., M.D., F.A.C.S. Commander, U. S. N. Gynecologist to Flower Hospital; President of Academy of Medicine of Toledo and Lucas County, 1912. Residence, River Road, R.F.D. No. 4; Office, 225 Michigan Street, Toledo, Ohio.

1907.—Moriarta, Douglas C., M.D., F.A.C.S. Senior Surgeon to Saratoga Hospital; Surgeon in chief to Saint Christian Hospital for Children; Director of State Experimental Station at Saratoga. 511 Broadway, Saratoga Springs, N. Y.

1904.—Morris, Lewis Coleman, M.D., F.A.C.S. Professor of Gynecology and Abdominal Surgery in the Birmingham Medical College; Secretary, Medical Association State of Alabama, 1904; Member of Jefferson County Board of Health. *Vice-president*, 1911. 1203 Empire Building, Birmingham, Ala.

1890.—Morris, Robert Tuttle, A.M., M.D., F.A.C.S., Maj., M.R.C., U. S. Army. Professor of Surgery in the New York Post-Graduate Medical School and Hospital. *Vice-president*, 1892; *Executive Council*, 1906, 1908–1911; *President*, 1907. 616 Madison Avenue, New York, N. Y.

1918.—Mosher, George Clark, A.M., M.D., F.A.C.S. President, Jackson County Medical Society; Chairman, Kansas City Medical Society; Consulting and Senior Attending Obstetrician of the Kansas City General and Christian Hospitals. Residence, 361 Locust Street; Office, 605 Bryant Building, Kansas City, Mo.

1896.—Noble, George Henry, M.D. F.A.C.S. Gynecologist to the Grady Hospital; Secretary to the Section on Obstetrics and Gynecology of American Medical Association, 1897; Member of the Southern Surgical and Gynecological Association. 186 South Pryor Street, Atlanta, Ga.

1903.—Noble, Thomas Benjamin, M.D. Professor of Abdominal Surgery in the Central College of Physicians and Surgeons; Consultant in the Diseases of Women at the City Hospital, City Dispensary, and Protestant Deaconess's Hospital, Indianapolis. 720 Newton Claypool Building, Indianapolis, Ind.

1907.—Olmsted, Ingersoll, M.D., F.A.C.S. Surgeon to the City and St. Joseph's Hospitals, Hamilton, Ont. 215 South James St., Hamilton, Ontario, Canada.

1899.—Pantzer, Hugo Otto, A.M., M.D., F.A.C.S., Past Professor, Surgical Pathology and Clinical Gynecology, in the Central College of Physicians and Surgeons; Past Professor Clinical Gynecology, Indiana Medical College, Medical Department of Purdue University; Late Professor of Clinical Gynecology in the Indiana Medical college, Medical Department of Indiana University; Gynecologist to Methodist Hospital; Past President of Indianapolis Medical Society; Member of Indiana State Association and American Medical Association. *President* 1915. 601 Hume-Mansur Bldg., Indianapolis, Ind.

1916.—Peck, George Augustus, M.D., Attending Surgeon, New Rochelle Hospital, New Rochelle, N. Y.; Consulting Surgeon, Westchester County Hospital, New York. Residence and Office 189 Centre Ave., New Rochelle, N. Y.

1916.—Percy, James Fulton, A.M., M.D., F.A.C.S., Maj., M.C., U. S. Army. Residence 593 East Losey St.; Office, 147 South Cherry St., Galesburg, Ill.

1899.—Pfaff, Orange G., M.D. Adjunct Professor of Obstetrics and Diseases of Women in the Medical College of Indiana; Gynecologist to the City, Deaconess's, and St. Vincent's Hospitals 1337 North Pennsylvania Street, Indianapolis, Ind.

1898.—Porter, Miles F., M.D., F.A.C.S., Chairman of the District Conscript Board No. 2, of Indiana. Professor of Surgery in the Indiana University School of Medicine; ex-President Indiana State Medical Society. *Vice-president*, 1902; *President*, 1912–1913. 2326 Fairfield Ave., Fort Wayne, Ind.

1902.—Porter, William D., M.D. Professor of Clinical Obstetrics, Medical College, University of Cincinnati; Assistant Director, Obstetrical Department, Cincinnati General Hospital. Residence, 3031 Reading Road; Office, 1 Melrose Building, Cincinnati, Ohio.

1914.—Potter, Irving White, M.D. Attending Obstetrician, St. Mary's Maternity Hospital; Instructor of Obstetrics, Medical Department, University of Buffalo; Attending Obstetrician, German Deaconess Hospital. Residence and Office, 420 Franklin St., Buffalo, N. Y.

1903.—Poucher, John Wilson, M.D., F.A.C.S. Consulting Surgeon to Vassar Brothers Hospital, Poughkeepsie. 339 Mill Street, Poughkeepsie, N. Y.

1919.—Quigley, James Knight, A.B., M.D. Junior Obstetrician to the Rochester General Hospital. Residence, 400 Westminster Road; Office, 303 Alexander Street, Rochester, N. Y.

1904.—Reder, Francis, M.D., F.A.C.S. Surgeon to Missouri Baptist Sanitarium; Surgeon to St. John's Hospital; Visiting Surgeon to St. Louis City Hospital, and allied Institutions. Residence, 6346 Berlin Avenue; Office, 415 University Club Building, St. Louis, Mo.

Founder.—Reed, Charles Alfred Lee, A.M., M.D., F.A.C.S., Maj., M.C., U. S. Army. Consulting Gynecologist, Cincinnati General Hospital; President, American Medical Association, 1900–1; Fellow, British Gynecological Society; Foundation member International Periodical Congress of Gynecology and Obstetrics; Cheva-

lier Legion of Honor, France; Fellow, National Academy of Medicine of Peru; President, Seventh Pan-American Medical Congress. *President*, 1898. Residence, 3544 Biddle Avenue; Office, 5 West Eighth Street, Cincinnati, Ohio.

1913.—Rongy, Abraham Jacob, M.D., F.A.C.S. Attending Gynecologist, Lebanon Hospital; Attending Surgeon, Jewish Maternity Hospital; Consulting Gynecologist, Rockaway Beach Hospital. Residence and Office, 62 West 89th Street, New York City.

1909.—Rosenthal, Maurice I., M.D., F.A.C.S. Surgeon to Saint Joseph's Hospital. 336 W. Berry Street, Fort Wayne, Ind.

1902.—Runyan, Joseph Phineas, M.D. Division Surgeon to the Choctaw, Oklahoma and Gulf Railroad; Secretary of the Arkansas State Medical Association, President, 1904. State Bank Bldg., Little Rock, Ark.

1906.—Ruth, Charles Edward, M.D., F.A.C.S., Maj., M.R.C., U. S. Army. Professor of Surgery and Clinical Surgery in the Keokuk Medical College (College of Physicians and Surgeons); Surgeon Iowa M. E. Hospital; Surgeon to Wabash Railway; Chief of Surgical Base Hospital, Camp Dodge, Ia. Surgeon to the Chicago and Rock Island Pacific Railway. Equitable Bldg., Des Moines, Iowa.

1903.—Sadlier, James Edgar, M.D., F.A.C.S. Attending Surgeon, St. Francis Hospital, Poughkeepsie, N. Y.; Surgeon-In-Chief, The Sadlier Hospital, Poughkeepsie, N. Y.; Consulting Surgeon, Highland Hospital, Beacon, N. Y. *Vice-president*, 1909. Residence and Office, 295 Mill Street, Poughkeepsie, N. Y.

1909.—Sanes, Kay Isadore, M.D., F.A.C.S., Capt., M.C., U. S. Army. Gynecologist to the West Penn Hospital; Consulting Gynecologist to the Montefiore Hospital, Pittsburgh. Residence, 234 McKee Place; Office, Jenkins Building, Pittsburgh, Pa.

1910.—Schildecker, Charles Bushfield, M.D. Assistant Gynecologist to Western Pennsylvania Hospital; Coroner's Physician of Allegheny County. Residence, 414 Rebecca Street; Office, 1105 Park Building, Pittsburgh, Pa.

1904.—Schwarz, Henry, M.D., F.A.C.S. Professor of Obstetrics, Medical Department of Washington University. *Vice-president*, 1911. 440 North Newstead Avenue, St. Louis, Mo.

1918.—Schwarz, Otto H., M.D. Instructor in Clinical Obstetrics, Washington University School of Medicine. Residence, 4947 Laclede Avenue; Office, 820 University Club Building, St. Louis, Mo.

1901.—Scott, N. Stone, A.M., M.D., F.A.C.S. Formerly Dean and Professor of Surgery, College of Physicians and Surgeons, Cleveland; Consulting Surgeon to City Hospital; Consulting Surgeon to St. John's Hospital; Surgeon to the Out-patient Department of Cleveland General Hospital. Residence, 531 Prospect Avenue; Office, 603–605 Citizens' Building, Cleveland, Ohio.

1895.—Sellman, William Alfred Belt, M.D. Gynecologist to The Biedler and Sellman Sanitarium; Member of the Medical and Chirurgical Faculty of Maryland; also of the Baltimore City Medical Society; also of the American Medical Association; the Gynecological and Obstetrical Association of Baltimore; Physician to The Margaret J. Bennett Home for Young Ladies. *Vice-president*, 1908; *Executive Council*, 1909–1910. 5 East Biddle Street, Baltimore, Maryland.

1899.—Simpson, Frank Farrow, A.B., M.D., F.A.C.S., Lieut. Col., M.C., U. S. Army. Chief Medical Section, Council of National Defense; Chief Section of Medical Industry. Gynecologist to the Allegheny General Hospital; Consulting Gynecologist to the Columbia Hospital. *Vice-president*, 1906. Jenkins Building, Pittsburgh, Pa.

1912.—Skeel, Arthur Julius, M.D., F.A.C.S. Assistant Professor of Obstetrics, Western Reserve University; Obstetrician to St. Luke's Hospital; Consulting Obstetrician to the Florence Crittenden Home; Consulting Obstetrician to the Woman's Hospital. Residence and Office, 1834 East 65th Street, Cleveland, Ohio.

1901.—Skeel, Roland Edward, M.D., F.A.C.S., Major, M.C., U. S. Army. Associate Clinical Professor of Gynecology in Western Reserve University; Gynecologist to St. Luke's, City, and Lutheran Hospitals; Consulting Surgeon to the Lakewood Hospital. 1000 Schofield Building, Cleveland, Ohio.

1910.—Smead, Lewis Frederic, A.B., M.D., F.A.C.S. Surgeon to St. Vincent's Hospital, Toledo. Residence, 2921 Parkwood Avenue; Office, 227 Michigan Street, Toledo, Ohio.

1902.—Stark, Sigmar, M.D., F.A.C.S. Professor of Obstetrics and Clinical Gynecology in the Cincinnati College of Medicine and Surgery; Gynecologist to the Jewish Hospital. 1108 East McMillan Street, Cincinnati, Ohio.

1919.—Stein, Arthur, M.D. Associate Gynecologist at Lenox Hill and Harlem Hospitals, New York City. Residence and Office, 48 East Seventy-fourth Street, New York, N. Y.

1908.—Stewart, Douglas Hunt, M.D., F.A.C.S. Surgeon O. P. D. Knickerbocker Hospital. Residence, 128 West 6th Street, New York, N. Y.

1911.—Stillwagen, Charles A., M.D., F.A.C.S. Residence, 5343 Pennsylvania Avenue; Office, 613 Jenkins Building, Pittsburgh, Pa.

1899.—Swope, Lorenzo W., M.D., F.A.C.S. Surgeon to the Consolidated Traction Company; Chief Surgeon to Wabash Railroad, Pittsburgh Division; Surgeon to Western Pennsylvania Hospital; Surgeon to Passavant Hospital; Member of the Allegheny County Medical Society; Member of the American Medical Association. Residence, 4629 Bayard Street; Office, 1105 Park Building, Pittsburgh, Pa.

1901.—Tate, Magnus Alfred, M.D., F.A.C.S. Professor of Obstetrics Miami Medical College; President Cincinnati Academy of Medicine, 1905; Obstetrician to the Cincinnati General Hospital and to the Good Samaritan Hospital. 19 West Seventh Street, Cincinnati, Ohio.

1908.—Torrance, Gaston, M.D. Surgeon to St. Vincent's and the Hillman Hospitals in Birmingham. Residence, 2705 Caldwell Avenue; Office, 325 Woodward Building, Birmingham, Ala.

1917.—Tovey, David William, M.D. Adjunct Professor of Gynecology, N. Y. Polyclinic Medical School; Gynecologist N. Y. Polyclinic Hospital; Gynecologist Harlem Dispensary. Residence and Office, 240 Riverside Drive, New York, N. Y.

1919.—Tracy, Stephen E., M.D., F.A.C.S. Gynecologist, Stetson and Gynecean Hospitals; Consulting Gynecologist, Jewish Maternity Hospital. Residence, 6600 North Twelfth Street; Office, 1527 Spruce Street, Philadelphia, Pennsylvania.

Founder.—Vander Veer, Albert, A.M., M.D., Ph.D., LL.D., F.A.C.S., Member Volunteer M.C. Five years Professor of Anatomy, Thirty-eight years Professor of Surgery, Albany Medical College; Surgeon-in-Chief, Albany Hospital; Consulting Surgeon, South End Dispensary; Consulting Surgeon, Benedictine Hospital, Kings-

ton, N. Y.; Consulting Surgeon, Champlain Valley Hospital, Plattsburgh, N. Y.; Consulting Surgeon, Crippled and Ruptured Children, West Haverstraw, N. Y.; Fellow of the American Surgical Association (President, 1906); Fellow of the British Gynecological Society; Member of the American Medical Association (First Vice-president and President, 1915); Member of the Southern Surgical and Gynecological Association; Corresponding Member of the Boston Gynecological Society; Vice-Chancellor of the Board of Regents of the University of the State of New York. *Executive Council*, 1889–1891, 1895–1905; *President*, 1892. 28 Eagle Street, Albany, N. Y.

1913.—Vander Veer, Edgar Albert, Ph.D., M.D., F.A.C.S. Attending Surgeon Albany Hospital; Consulting Surgeon, Champlain Valley Hospital, Plattsburgh, N. Y. Residence, 150 State St.; Office, 28 Eagle St., Albany N. Y.

1912.—Van Sweringen, Budd, M.D., Maj., M.R.C., U. S. Army. Gynecologist to the Lutheran Hospital, Surgeon to Pennsylvania Railroad; Formerly Professor of Medicine, Ft. Wayne College of Medicine. 208 Washington Boulevard, Fort Wayne, Indiana.

1909.—Wade, Henry Albert, M.D., F.A.C.S. Visiting Surgeon to Bethany Deaconess's Hospital; Attending Gynecologist to Williamsburg Hospital, Brooklyn. 495 Greene Avenue, Brooklyn, N. Y.

1909.—Waldo, Ralph, M.D., F.A.C.S. Gynecologist to Lebanon Hospital; Associate Surgeon to the Woman's Hospital of the State of New York; Consulting Obstetrician, Jewish Maternity Nyack Hospital and Rockaway Beach Hospital. 54 W. 71st Street, New York, N. Y.

1891.—Walker, Edwin, M.D., Ph.D., F.A.C.S. Surgeon to the Walker Hospital; Gynecologist to the Evansville City Hospital; President of the Indiana State Medical Society, 1892; Member of the American Medical Association and of the Mississippi Valley Medical Association; Member of the Southern Surgical and Gynecological Association; First Vice-president American Medical Association, 1907. *Vice-president*, 1901. 712 South Fourth Street, Evansville, Ind.

1907.—Weiss, Edward Aloysius, M.D., F.A.C.S., Lieut. Com., M.C., U. S. N. Gynecologist to Mercy Hospital; Gynecologist to Presbyterian Hospital; Obstetrician to Rosalia Maternity Hospital; Assistant Professor of Gynecology at University of Pittsburgh, Medical Department. 714 Jenkins Building, Pittsburgh, Pa.

1914.—Welton, Thurston Scott, M.D., F.A.C.S. Clinical Instructor of Gynecology and Obstetrics in the Long Island College Hospital; Associate Attending Gynecologist and Obstetrician to the Williamsburgh Hospital; Associate Visiting Gynecologist and Obstetrician to the Greenpoint Hospital; President Brooklyn Medical Society, 1917; Fellow Brooklyn Gynecological Society. Residence and Office, 842 Union Street, Brooklyn, New York.

1904.—West, James Nephew, M.D., F.A.C.S. Professor of Diseases of Women and Secretary of the Faculty at the New York Post-Graduate Medical School and Hospital. *Vice-president*, 1906. 71 West Forty-ninth Street, New York.

1896.—Westmoreland, Willis Foreman, M.D., F.A.C.S. Professor of Surgery at the Atlanta Medical College. Suite 241, Equitable Building, Atlanta, Ga.

1911.—White, George R., B.S., M.D., F.A.C.S. Surgeon Park View Sanitarium. 2 Liberty E., Savannah, Ga.

1916.—Wing, Lucius Arthur, B.Sc., M.D., Capt., M.C., U. S. Army, Attending Surgeon, Lying-In Hospital, City of New York; Assisting Surgeon, St. Mary's Free Hospital for Children; Instructor in Clinical Surgery, Cornell University Medical College. Office and Residence, 53 East Sixth-fifth Street, New York, N. Y.

1909.—Yates, H. Wellington, M.D., F.A.C.S. Gynecologist to St. Mary's Hospital; Gynecologist to Providence Hospital; Assistant Professor of Gynecology, Detroit College of Medicine and Surgery; Member of the Section on Obstetrics, Gynecology and Abdominal Surgery of the American Medical Association; Member of the Staff of St. Luke's Hospital; Member of the Wayne County and Michigan State Medical Society; President Detroit Medical Club; Medical Director of the Peninsular Life Insurance Co. Residence, 1360 Fort Street, West; Office, 607 Gas Office Building, Detroit, Mich.

1907.—Ziegler, Charles Edward, A.M., M.D., F.A.C.S. Professor of Obstetrics in the University of Pittsburgh; Medical Director of the Elizabeth Steele Magee Hospital for Women; Medical Director of the Pittsburgh Maternity Dispensary; Consulting Obstetrician to the Columbia Hospital and Consulting Obstetrician and Gynecologist to the Dixmont Hospital for the Insane. 406 Morewood Ave., Pittsburgh, Pa.

1900.—Zinke, Ernst Gustav, M.D., F.A.C.S., Professor of Obstetrics and Clinical Midwifery in the Ohio-Miami Medical College, University of Cincinnati, 1896–1916. Emeritus Professor of Obstetrics, 1916. Consulting Obstetrician to Cincinnati General Hospital. Honorary Chief of Staff, and Obstetrician and Gynecologist to the Deaconess Hospital; President of the Cincinnati Obstetric Society, 1887; President Academy of Medicine of Cincinnati, 1894; Member and Chairman of Section on Obstetrics, Gynecology and Abdominal Surgery, American Medical Association, 1914; Member Southern Surgical Association; Honorary Member Jackson County Medical Society, Kansas City, Mo.; Honorary Member, Cincinnati Obstetric Society. *President*, 1908. *Executive Council*, 1909–1911. *Secretary*. 4 West Seventh St., Cincinnati, Ohio.

Total, one hundred and twenty-nine Ordinary Fellows.

ORDINARY FELLOWS, DECEASED.

1902.—Abrams, Edward Thomas, A.M., M.D., F.A.C.S., Dollar Bay, Mich., 1918.

1890.—Asdale, William James, M.D., Beaver Falls, Pa., 1912.

Founder.—Baker, Washington Hopkins, M.D., Philadelphia, Pa., 1904.

1913.—Blume, Frederick, M.D., Pittsburgh, Pa., 1918.

1894.—Brown, John Young, M.D., F.A.C.S., St. Louis, Mo., 1919.

1889.—Burns, Bernard, M.D., Allegheny, Pa., 1892.

1890.—Coles, Walter, M.D., St. Louis, Mo., 1892.

1889.—Davis, William Elias B., M.D., Birmingham, Ala., 1903.

1892.—Dorsett, Walter Blackburn, M.D., F.A.C.S., St. Louis, Mo., 1915.

1892.—Duff, John Milton, A.M., M.D., Ph.D., Pittsburgh, Pa., 1904.

1898.—Dunn, James C., M.D., Pittsburgh, Pa., 1907.

1892.—Dunning, Lehman Herbert, M.D., Indianapolis, Ind., 1906.

1899.—Eastman, Thomas Barker, A.B., M.D., F.A.C.S., Indianapolis, Ind., 1919.

1895.—Ferguson, Alexander Hugh, M.D., Chicago, Ill., 1911.

1890.—Frederick, Carlton Cassius, B.S., M.D., Buffalo, N.Y., 1911.

1913.—Freeland, James Roy, M.D., F.A.C.S., Pittsburgh, Pa. 1917.

1891.—Gibbons, Henry, Jr., A.M., M.D., San Francisco, Cal., 1912.

1904.—Goodfellow, George E., M.D., Los Angeles, Cal., 1910.

1913.—Gray, Frank D., M.E.D., M.D. F.A.C.S., Jersey City, N.J., 1916.

1892.—Haggard, William David, Sr., M.D., Nashville, Tenn., 1901.

Founder.—Hill, Hampton Eugene, M.D., Saco, Me., 1894.

1912.—Hotaling, Albert Steuben, M.D., Syracuse, N. Y., 1913.

1898.—Hyde, Joel W., M.D., Brooklyn, N. Y., 1907.

1897.—Ingraham, Henry Downer, M.D., Buffalo, N. Y., 1904.

1909.—Jacobson, Julius H., M.D., F.A.C.S., Toledo, O., 1919.

Founder.—Jarvis, George Cyprian, M.D., Hartford, Conn., 1900.

1892.—Jelks, James Thomas, M.D., Hot Springs, Ark., 1902.

1910.—Jenks, Nathan, B.S., M.D., F.A.C.S., Detroit, 1916.

1900.—Linville, Montgomery, A.B., M.D., New Castle, Pa., 1910.

Founder.—Lothrop, Thomas, M.D., Buffalo, N. Y., 1902.

1891.—McCann, James, M.D., Pittsburgh, Pa., 1893.

1898.—McCann, Thomas, M.D., Pittsburgh, Pa., 1903.

1896.—Mooney, Fletcher D., M.D., St. Louis, Mo., 1897.

1894.—Murphy, John Benjamin, A.M., M.D., F.A.C.S., Chicago, Ill., 1916.

Founder.—Potter, William Warren, M.D., Buffalo, N. Y., 1911.

Founder.—Price, Joseph, M.D., Philadelphia, Pa., 1911.

1896.—Rhett, Robert Barnwell, Jr., M.D., Charleston, S. C., 1901.

1889.—Rohe, George Henry, M.D., Baltimore, Md., 1899.

1892.—Rosenwasser, Marcus, M.D., Cleveland, O., 1910.

1890.—Ross, James Frederick Wm., M.D., C.M., L.R.C.P., Toronto, Ontario, Canada, 1911.

1889.—Seymour, William Wotkyns, A.B., M.D., Troy, N. Y., 1904.

1902.—Simons, Manning, M.D., Charleston, S. C., 1911.

1913.—Smith, Lewis W., A.B., M.D., Pittsburgh, Pa., 1917.

1913.—Stamm, Martin, M.D., F.A.C.S., Freemont, O., 1918.

1914.—Strasser, August Adrian, M.D., F.A.C.S., Arlington, N. J., 1918.

Founder.—Townsend, Franklin, A.M., M.D., Albany, N. Y., 1895.

1907.—Vance, Ap Morgan, M.D., F.A.C.S., Louisville, Ky., 1915.

Founder.—Werder, Xavier Oswald, M.D., F.A.C.S., Phittsburg, Pa., 1919.

ORDINARY FELLOWS.

Classified.

ALABAMA.

Davis, John D. S.,	2031 Avenue G.,	Birmingham.
Morris, Lewis Coleman,	1203 Empire Bldg.,	Birmingham.
Torrance, Gaston,	325 Woodward Bldg.,	Birmingham.

ARKANSAS.

Runyan, Joseph Phineas,	State Bank Bldg.,	Little Rock.

CALIFORNIA.

Buteau, Samuel H.,	1155 Broadway,	Oakland.
Hadden, David,	Oakland Bank of Savings Bldg.,	Oakland.

CANADA.

Olmsted, Ingersoll,	215 South James St.,	Hamilton, Ontario.

GEORGIA.

Noble, George Henry,	186 South Pryor Street,	Atlanta.
Westmoreland, W. F.,	241 Equitable Bldg.,	Atlanta.
White, George R.,	2 Liberty E.,	Savannah.

ILLINOIS.

Bacon, Joseph Barnes,		Macomb.
Barrett, Chan ning,	561 Stratford Place,	Chicago.
Goldspohn, Albert,	34 Washington St..	Chicago.
Percy, James F.,	147 S. Cherry St.,	Galesburg.

INDIANA.

Walker, Edwin,	712 South Fourth St.,	Evansville.
Porter, Miles F.,	207 West Wayne St.,	Fort Wayne.
Rosenthal, M. I.,	336 West Berry St.,	Fort Wayne.
Van Sweringen, Budd,	208 Washington Blvd.,	Fort Wayne.
Burckhardt, Louis,	621 Hume Mansur Bldg.,	Indianapolis.
Clark, Edmund D.,	712 Hume Mansur Bldg.,	Indianapolis.
Noble, Thomas B.,	720 Newton Claypool Bldg.,	Indianapolis.
Pantzer, Hugo O.,	224 North Meridian St.,	Indianapolis.
Pfaff, O. G.,	1337 North Pennsylvania St.,	Indianapolis.

IOWA.

Ruth, Charles E.,	407 Equitable Bldg.,	Des Moines

KENTUCKY.

Frank, Louis,	The Atherton,	Louisville.

MAINE.

Leighton, Adam P.,	192 State St.,	Portland.

MARYLAND.

Branham, Joseph H.,	2200 Eutaw Place,	Baltimore.
Sellman, William A. B.,	5 East Biddle St.,	Baltimore.

MICHIGAN.

Bell, John Norval,	506 Washington Arcade,	Detroit.
Brown, Geo. Van Amber,	32 Adams Ave., West,	Detroit.
Carstens, J. Henry,	620 Woodward Ave.,	Detroit.
Davis, James E.,	1229 David Whitney Bldg.,	Detroit.
Hewitt, H. W.,	1131 David Whitney Bldg.,	Detroit.
Longyear, H. W.,	32 Adams Ave., W.	Detroit.
Manton, Walter P.,	32 Adams Ave., West,	Detroit.
Yates, H. Wellington,	1360 Fort Street,	Detroit.

MINNESOTA.

Litzenberg, Jennings C.,	Donaldson Bldg.,	Minneapolis.

MISSOURI.

Mosher, G. C.,	605 Bryant Bldg.,	Kansas City.
Crossen, H. S.,	Metropolitan Bldg.,	Saint Louis.
Elbrecht, Oscar H.,	Metropolitan Bldg.,	Saint Louis.
Jonas, Ernst,	465 North Taylor Ave.,	Saint Louis.
Kirchner, Walter C. G.,	508 Metropolitan Bldg.,	Saint Louis.
Reder, Francis,	415 University Club Bldg.,	Saint Louis.
Schwarz, Henry,	440 North Newstead Ave.,	Saint Louis.
Schwarz, O. H.,	820 University Club Bldg.,	Saint Louis.

NEBRASKA.

Findley, Palmer,	418 Brandeis Theater Bldg.,	Omaha.

NEW JERSEY.

Darnall, Wm. Edgar,	1704 Pacific Ave.,	Atlantic City.
Marvel, Emery,	1801 Pacific Ave.,	Atlantic City.
Dickinson, Gordon K.,	280 Montgomery St.,	Jersey City.
Ill, Charles L.,	188 Clinton Ave.,	Newark.
Ill, Edward J.,	1002 Broad St.,	Newark.
Hedges, Ellis W.,	703 Watchung Ave.,	Plainfield.

NEW YORK.

Boyd, James P.,	152 Washington Ave.,	Albany.
Vander Veer, Albert,	28 Eagle Street,	Albany.
Vander Veer, Edgar A.,	150 State St.,	Albany.
Wade, Henry A.,	495 Greene Ave.,	Brooklyn.
Welton, T. Scott,	842 Union St.,	Brooklyn.
Hayd, H. E.,	493 Delaware Ave.,	Buffalo.
King, James E.,	1248 Main St.,	Buffalo.
Lothrop, Earl P.,	153 Delaware Ave.,	Buffalo.
Potter, Irving W.,	420 Franklin St.,	Buffalo.
Chandler, George,	11 East Chestnut St.,	Kingston.
Peck, George A.,	189 Centre Ave.,	New Rochelle
Bainbridge, W. S.,	34 Gramercy Park,	New York.
Bandler, S. W.,	134 West Eighty-seventh St.,	New York.
Davis, Asa B.,	42 East 35th St.,	New York.
Erdmann, John F.,	60 West Fifty-second St.,	New York.
Furniss, Harry Dawson,	54 East 48th St.,	New York.
Harrar, James A.,	29 East Seventy-seventh St.,	New York.
Hill, I. L.,	616 Madison Ave.,	New York.
Kosmak, G. W.,	23 East 93rd St.,	New York.
Lynch, Jerome Morley,	57 East 52nd St.,	New York.
McPherson, Ross A.,	45 West 62nd St.,	New York.
Meeker, Harold D.,	420 West End Ave.,	New York.
Morris, R. T.,	616 Madison Ave.,	New York.
Rongy, Abraham J.,	62 West 89th Street,	New York.
Stein, Arthur,	48 East 74th St.,	New York.
Stewart, Douglas H.,	128 West 86th St.,	New York.
Tovey, David W.,	240 Riverside Drive,	New York.
Waldo, Ralph,	54 West 71st St.,	New York.
West, James N.,	71 West Forty-ninth St.,	New York.
Wing, Lucius A.,	53 East 65th St.,	New York.
Brown, Wm. M.	1776 East Ave.,	Rochester.
Quigley, J. K.,	303 Alexander St.,	Rochester.
Moriarta, Douglas C.,	511 Broadway,	Saratoga Springs.
Sadlier, James E.,	295 Mill St.,	Poughkeepsie.
Poucher, John W.,	339 Mill St.,	Poughkeepsie.
Miller, A. B.,	326 Montgomery St.,	Syracuse.

OHIO.

Bonifield, Chas. L.,	409 Broadway,	Cincinnati.
Hall, Joseph A.,	628 Elm St.,	Cincinnati.
Hall, Rufus B.,	628 Elm St.	Cincinnati.
Miller, John D.,	N. E. Cor. Clifton & McMillan,	Cincinnati.
Porter, W. D.,	Melrose Bldg.,	Cincinnati.
Reed, C. A. L.,	The Groton,	Cincinnati.
Stark, Sigmar,	1108 East McMillan St.,	Cincinnati.
Tate, Magnus A.,	19 West Seventh St.,	Cincinnati.
Zinke, E. G.,	4 West 7th St.,	Cincinnati.
Bill, A. H.,	Osborn Bldg.,	Cleveland.

Crile, George W.,	Osborn Bldg.,	Cleveland.
Humiston, William H.,	536 Rose Bldg.,	Cleveland.
Scott, N. Stone,	603 Citizens Bldg.,	Cleveland.
Skeel, Arthur,	1834 East 65th St.,	Cleveland.
Skeel, Roland Edward,	1000 Schofield Bldg.,	Cleveland.
Baldwin, James F.,	405 East Town St.,	Columbus.
Crotti, André,	51 East Broad St.,	Columbus.
Goodman, S. J.,	121 South 6th St.,	Columbus.
Hamilton, Chas. S.,	142 South Garfield St.,	Columbus.
Dice, Wm. Gordon,	240 Michigan St.,	Toledo.
Gillette, Wm. J.,	1613 Jefferson St.,	Toledo.
Moots, Chas. W.,	225 Michigan St.,	Toledo.
Smead, Lewis F.,	227 Michigan St.,	Toledo.
McClellan, Benjamin R.,	7 East Second St.,	Xenia.

PENNSYLVANIA.

Kennedy, James W.,	1409 Spruce St.,	Philadelphia.
Tracey, S. E.,	1527 Spruce St.,	Philadelphia.
Foster, Curtis S.,	308 Diamond Bank Bldg.,	Pittsburgh.
Huggins, R. R.,	1018 Westinghouse Bldg.,	Pittsburgh.
Langfitt, William S.,	Jenkins Bldg.,	Pittsburgh.
Sanes, K. I.,	Jenkins Bldg.,	Pittsburgh.
Schildecker, Charles B.,	1105 Park Bldg.,	Pittsburgh.
Simpson, Frank F.,	Jenkins Bldg.,	Pittsburgh.
Stillwagen, Charles A.,	13 Jenkins Bldg.,	Pittsburgh.
Swope, Lorenzo W.,	1105 Park Bldg.,	Pittsburgh.
Weiss, Edward A.,	714 Jenkins Bldg.,	Pittsburgh.
Ziegler, Chas. E.,	406 Morewood Ave.,	Pittsburgh.

RHODE ISLAND.

Jones, Arthur T.,	81 Elm Grove Ave.,	Providence.
Keefe, John W.,	259 Benefit St.,	Providence.

TENNESSEE.

Haggard, William D.,	148 Eighth Ave., North,	Nashville.

VIRGINIA.

Baughman, Greer,	26 North Laurel St.,	Richmond.
Bosher, Lewis C.,	422 East Franklin St.,	Richmond.

MINUTES OF THE PROCEEDINGS

OF THE

THIRTY-SECOND ANNUAL MEETING

OF THE

AMERICAN ASSOCIATION

OF

OBSTETRICIANS AND GYNECOLOGISTS

HELD AT

THE GIBSON HOTEL

CINCINNATI, OHIO

SEPTEMBER 15, 16, AND 17, 1919.

THIRTY-SECOND ANNUAL MEETING

SEPTEMBER 15, 16 and 17, 1919.

The Fellows whose names appear below were present:

BAINBRIDGE, WM. SEAMAN, Commander, U. S. N. R. F. . . . . NEW YORK CITY.
BALDWIN, JAMES F. . . . . COLUMBUS, O.
BELL, JOHN N. . . . . DETROIT, MICH.
BILL, ARTHUR H. . . . . CLEVELAND, O.
BONIFIELD, CHARLES L. . . . . CINCINNATI, O.
BROWN, G. VAN AMBER, ... DETROIT, MICH.
BURCKHARDT, LOUIS. . . . . INDIANAPOLIS, IND.
CARSTENS, J. HENRY, ... DETROIT, MICH.
CHANDLER, GEORGE. . . . . KINGSTON, N. Y.
CLARK, EDMUND D. . . . . INDIANAPOLIS, IND.
CRILE, GEORGE W . . . . . CLEVELAND, O.
CROTTI, ANDRE . . . . . COLUMBUS, O.
DARNALL, WM. EDGAR. . . . . ATLANTIC CITY, N. J.
DAVIS, ASA B . . . . . NEW YORK, N. Y.
DAVIS, JAMES E. . . . . DETROIT, MICH.
DAVIS, JOHN D. S. . . . . BIRMINGHAM, ALA.
DICE, WILLIAM G. . . . . TOLEDO, O.
DICKINSON, GORDON K. . . . . JERSEY CITY, N. J.
ERDMANN, JOHN F. . . . . NEW YORK, N. Y.
FINDLEY, PALMER . . . . . OMAHA, NEB.
FRANK, LOUIS. . . . . LOUISVILLE, KY.
GILLETTE, WM. J. . . . . TOLEDO, O.
GOLDSPOHN, ALBERT. . . . . CHICAGO, ILL.
GOODMAN, SYLVESTER J. . . . . COLUMBUS, O.
HADDEN, DAVID . . . . . OAKLAND, CAL.
HALL, JOSEPH A. . . . . CINCINNATI, O.
HALL, RUFUS B. . . . . CINCINNATI, O.
HARRAR, JAMES A. . . . . NEW YORK, N. Y.
HUGGINS, RALEIGH R. . . . . PITTSBURG, PA.
ILL, EDWARD J. . . . . NEWARK, N. J.

JONES, ARTHUR T. . . . . Providence, R. I.
KEEFE, JOHN W. . . . . Providence, R. I.
KING, JAMES E. . . . . Buffalo, N. Y.
McCLELLAN, BENJAMIN R. . . . . Xenia, O.
McPHERSON, ROSS . . . . . New York, N. Y.
MILLER AARON B. . . . . Syracuse, N. Y.
MILLER, JOHN D. . . . . Cincinnati, O.
MOOTS, CHARLES W. . . . . Toledo, O.
MORIARTA, DOUGLAS C. . . . . Saratoga Springs, N. Y.
MORRIS, ROBERT T. . . . . New York, N. Y.
NOBLE, THOMAS B. . . . . Indianapolis, Ind.
PANTZER, HUGO O. . . . . Indianapolis, Ind.
PFAFF, ORANGE G. . . . . Indianapolis, Ind.
PORTER, MILES F.. . . . . Fort Wayne, Ind.
PORTER, WM. D. . . . . Cincinnati, O.
POTTER, IRVING W.. . . . . Buffalo, N. Y.
POUCHER, J. WILSON . . . . . Poughkeepsie, N.Y
REDER, FRANCIS. . . . . St. Louis, Mo.
REED, CHARLES A. L.. . . . . Cincinnati, O.
RONGY, ABRAHAM J. . . . . New York, N. Y.
RUNYAN, JOSEPH P.. . . . . Little Rock, Ark.
SADLIER, JAMES E. . . . . Poughkeepsie, N. Y.
SCHWARZ, OTTO H.. . . . . St. Louis, Mo.
SELLMAN, W. A. B.. . . . . Baltimore, Md.
SKEEL, ARTHUR J. . . . . Cleveland, O.
SKEEL, ROLAND E. . . . . Cleveland, O.
STARK, SIGMAR. . . . . Cincinnati, O.
TATE, MAGMUS A. . . . . Cincinnati, O.
VANDER VEER ,EDGAR A. . . . . Albany, N. Y.
WADE, HENRY A. . . . . Brooklyn, N. Y.
WEISS, EDWARD A. . . . . Pittsburgh, Pa.
WELTON, THURSTON S.. . . . . Brooklyn, N. Y.
WERDER, XAVIER O. . . . . Pittsburgh, Pa.
YATES, H. WELLINGTON . . . . . Detroit, Mich.
ZINKE, E. GUSTAV . . . . . Cincinnati, O.

Total, 5

The following-named guests were extended the privileges of the floor and invited to participate in the discussions:

Bange, Theo. . . . . Cincinnati, O.
Brooks, J. C. . . . . Pittsburgh, Pa.

Cadwalladar, J. C.. . . . . Cincinnati, O.
Conn, Caroline C.. . . . . Cincinnati, O.
Curry, E. A.. . . . . Cincinnati, O.
Cusher, L. M.. . . . . Cincinnati, O.
Dauch, S. Bertha . . . . . Cincinnati, O.
Davies, D. J. . . . . Cincinnati, O.
Douglass, Fred M.. . . . . Toledo, O.
Draper, W. F., P.A. Surg., U.S.P.H.S. . . . Richmond, Va.
Drury, A. G. . . . . Cincinnati, O.
Dunham, A. H. . . . . Dayton, O.
Fackler, George A.. . . . . Cincinnati, O.
Fair, H. D. . . . . Muncie, Ind.
Farr, Robert Everett. . . . . Indianapolis, Ind.
Gaston, R. E. . . . . Cincinnati, O.
Gillespie, William . . . . . Cincinnati, O.
Goldberg, S. J.. . . . . Cincinnati, O.
Harris, F. H. . . . . Cincinnati, O.
Hays, Thos, W.. . . . . Cincinnati, O.
Herman, Wm. C.. . . . . Cincinnati, O.
Hewitt, H. W.. . . . . Detroit, Mich.
Hier, Wm. G. . . . . Cincinnati, O.
Hottendorf, L. P. . . . . Cincinnati, O.
Johnson, R. J., Jr. . . . . Cincinnati, O.
Linss, Louis P.. . . . . Cincinnati, O.
Lummis, George D.. . . . . Middletown, O.
McCollum, Chas W. . . . . Erlanger, Ky
McKibben, Jas T. . . . . Cincinnati, O.
McLaughlin, A. J., Surg. U. S. P. H. S.
(Reserve). . . . . Sioux City, Iowa.
Matthews, Wm. J.. . . . . Johnson City, Tenn.
Matuska, Anthony,. . . . . Cincinnati, O.
Meitus, Joseph. . . . . Cincinnati, O.
Mendenhall, A. M.. . . . . Winchester, Ind.
Mendenhall, T. E. . . . . Johnstown, Pa.
Meserve, John S.. . . . . Cincinnati, O.
Nelson, A. W. . . . . Cincinnati, O.
Paul, Chas. M. . . . . Cincinnati, O.
Peters, Wm. H. . . . . Cincinnati, O.
Pirrung, J. Edward. . . . . Cincinnati, O.
Ratterman, Helena T. . . . . Cincinnati, O.
Reed, Guy . . . . . Beaumont, Texas.
Repass, J. F. . . . . Wytheville, Va.

Ruddell, Karl R.	Indianapolis, Ind.
Shields, Claude L.	Salt Lake City, Utah
Sikes, George O.	Cincinnati, O.
Solar, F. M.	Cincinnati, O.
Spurney, Albert F.	Cleveland, O.
Thompson, Nathan L.	Everett, Wash.
Turner, Charles E.	Columbus, O.
Van Hoosen, Bertha	Chicago, Ill.
Walker, A. R.	Cincinnati, O.
Wetherell, F. S.	Syracuse, N. Y.
White, H. F.	Washington, D. C.
Williams, J. G.	Cincinnati, O.
Zeublin, Ernst	Cincinnati, O.

Total, 56.

FIRST DAY—*Monday, September* 15, 1919.

Morning Session.—The Association met in the Ballroom of Hotel Gibson at 9:30 A. M. and was called to order by the President, Dr. John F. Erdmann, New York City, who said: I will ask Dr. Tate to introduce Hon. John Galvin, Mayor of Cincinnati.

DR. TATE.—Mr. President and Fellows of the American Association of Obstetricians and Gynecologists: Cincinnati, in a way, occupies a rather unique position. Some years ago we had an election for mayor. Over one-half of the people in Cincinnati voted for the present incumbent, and less than one-half did not vote. Of this one-half that did not vote, about one-half of them were rather sorry they did not vote, about one-half of them were rather sorry they did not vote for the man I am going to introduce. The reason for this is that this man has backbone; he is fearless, and he does exactly what he thinks is absolutely right. His judicial temperament enables him to make good appointments. Sometime ago here in Cincinnati we had a strike of the firemen and policemen, and he held up his right hand with his fist closed and said, "This does not go in Cincinnati; we have no Bolshevism in Cincinnati." (Applause.)

So it gives me very great pleasure indeed to introduce Hon. John Galvin, Mayor of Cincinnati, to give you a welcome. (Applause.)

ADDRESS OF WELCOME BY MAYOR GALVIN.

MR. PRESIDENT, Members of the American Association of Obstetricians and Gynecologists, Ladies and Gentlemen: Dr. Tate in presenting me to you, said that nearly one-half of the minority did

not vote for me and now they wish they did. I fear very often that more than one-half of those who did vote for me wish now that they had not done so. (Laughter.) So things adjust themselves up, you know.

I am very glad to be permitted to come here to bid you a welcome to this city. I can see by looking into your faces the type and character of men who are engaged in this great work, in this great specialty of yours. I have had some experience with the men of this city who make a specialty of the work in which you are engaged. I know the type and character of men they are, and I know therefore the type of men that make up your organizations all over the country.

I often think that no greater or better work can be performed than that in which you are engaged in assisting and caring for women, and of bringing into the world children, and then taking care of the women and children as well. It is a wonderful thing, and a beautiful thing, and I am glad you are here in our city for the purpose of holding your convention. I am sure that this meeting will result in good for our city.

Undoubtedly, most of you know that the city of Cincinnati has constructed a great municipal hospital. I suppose every one of you will see that hospital before you leave our city, and I hope and trust you will. Sometimes I talk about this hospital with a little fear and a little doubt, because the great problem of a municipality is to raise enough money to maintain all of its various departments. The hospital is one of the departments of the city that takes a great deal of money, and unfortunately cities cannot always raise all the money they require. Take, for example, the cities in this great State of Ohio. We can only raise, or rather, let me put it the other way, we can only levy taxes within certain limitations placed upon the cities by the legislature of the state, and these limitations do not enable us to meet the high cost of living in these late days. The city of Cincinnati cannot raise by taxes nearly enough money to perform its absolutely necessary functions. It is a great problem, therefore, which confronts us to maintan the Police and Fire Departments and other departments, and when I see how much I am required to get for the hospital, I am inclined sometimes to slight on the hospital. In the end, however, I know that one of the greatest things the city of Cincinnati has ever done, and one of the best things it does now, is the construction and the maintenance of that great hospital, affording a refuge for the sick poor, and holding out as an example to all other cities within the land the proper way to care for the sick poor of the municipality. (Applause.)

I trust that every one of you will see our splendid institution and encourage us by your approval in the work we have done in constructing it and the work we are trying to do in properly maintaining it.

Cincinnati has shown by the construction of this hospital, its d sire to make progress and to carry on municipal work of a high quality. I know that it appeals to you more than any other work in which we might be engaged; but in many other ways the city is striving to build up a great municipal government and a good place in which people may live, enjoy life, and continue in happiness and prosperity. I am therefore pleased to have an opportunity to welcome you to a city of that kind. Cincinnati is a hospitable city. Our people are always glad to welcome guests within our gates, and I am sure if the members of your own profession fail in any respect to offer you a hospitable greeting and welcome such as you ought to have, that there are thousands and hundreds of thousands who are common, everyday people who will be glad to meet you and welcome you and make your stay in this city very pleasant.

I hope your business and scientific affairs will be conducted in a way that will accrue to the benefits of yourselves, your organization, your profession, to the world, and to the people of the world, because that, after all, is your real purpose.

When you shall have accomplished good in this respect and shall have had an enjoyable visit in our city, I trust you will go away with the feeling that Cincinnati is a beautiful city, a hospitable city, and a goodly city in every way.

Let me say to you, before I close, that Cincinnati is not only a good city, a hospitable city, but above everything else, it has been and is an American city. (Applause.) I do not know but what some of you who have come from afar may have heard, two or three years ago, whispering that Cincinnati was somewhat of a German city. We have a large population in this city whose ancestors came from Germany many years ago, seeking not only a haven of rest and an opportunity for advancement in their everyday lives, but seeking above that, a place where they would be free from the restrictions of a tyrannical government; where they could live under a government that was free and open, and where every one had the same opportunity in life. (Applause.) This kind of people came to our city in great numbers; they established here their homes, and when the United States entered the war with the ancestral country, their sons and their grandsons were the first to respond to the call of our country for soldiers. No city in all the land produced by volunteer and by draft better soldiers than this splendid city of

Cincinnati, and thousands and tens of thousands of them bore German names. When the call came from our country for money, for bond subscription, no city in all America went over the top quite as soon as we did, so that in every way possible this city has been one hundred per cent. American.

Some of you may have visited us thirteen or more years ago, when our water was drawn from the Ohio River. Since then, we have built a new water system, so that now you find in your bathtubs as pure water as you can bathe in. Our people drink it now. I see some of the doctors smile. When I say they drink it, it is not because they have to, but because they have always enjoyed it. (Laughter.) In the old days people were accustomed to have a good time, when the breweries were wide open to you, and that seemed to please many of the audience, even doctors. Now, I would say, if you should get into trouble, call on the mayor, and he will deal with you most generously, and, I would add, he will get you out when your time is up. (Laughter.) Prior to the construction of our new water system, our typhoid fever rate was, I believe, almost higher than that of any other city in the land. Now, there is no city in America that has as low a record of typhoid fever cases as has Cincinnati, and it is largely because of the construction of a splendid water system and the purification of the water by a filtration system that our people have been given healthful water to drink as well as to bathe in.

Again, gentlemen, I say to you, on behalf of our people and our city, we are glad to have you in our midst, and we hope your stay will be pleasant and that you will come to see us again. (Loud applause.)

Dr. Tate.—Cincinnati has an Academy of Medicine with a membership of over five hundred, and each and every member of this profession in Cincinnati considers it a great honor to be elected to the presidency. Unfortunately, Dr. Carothers, who was to welcome us this morning, is unavoidably out of the city, but we have a most excellent substitute, and I take great pleasure in introducing Dr. Nora Crotty, the First Vice-President of the Cincinnati Academy of Medicine, to welcome you.

ADDRESS OF WELCOME BY DR. NORA CROTTY.

Mr. President, Honorable Mayor, *Officers and Members of the American Association of Obstetricians and Gynecologists:* You scarcely need any further assurance of your welcome to Cincinnati. Our mayor has most cordially greeted you and convinced you that

Cincinnati is a good place in which to be, and while you are here our city is yours. The medical profession of Cincinnati, however, would supplement what the mayor has said by a word of greeting and by the further assurance that not only civic Cincinnati but medical Cincinnati bids you welcome.

Many of our leading physicians are members of your organization, and we are very proud to be represented in such an association as yours. It is well known, I am sure, that the *American Association of Obstetricians and Gynecologists* is one of the foremost organizations, if not the foremost medical association in the land. We know that your work is the most difficult part of medicine. The successful gynecologist to-day, and more especially the successful obstetrician, must bring to his work more scientific study, more patience, more human sympathy, and oftentimes more physical labor than the physician in any other part of medicine, and for that he gets no glory and sometimes very little pay. The very nature of his work precludes the possibility of such spectacular reward as the general surgeon sometimes receives. The obstetrician, however, has the comforting feeling of knowing that he relieves more physical and mental suffering; that he saves more lives, and he further has the assurance of knowing that he is the most essential factor in medicine, more so than any other doctor. It takes a high minded man to dedicate his life to hard work when he knows he must wait for another existence to receive adequate reward.

It is fitting that you should hold your first meeting in this city where your organization was born. Since its beginning you have done much good work, and I am sure the success that your association has attained in these intervening years is only commensurate with the high ideals, singleness of purpose, and earnestness of your members, both individually and collectively.

We are glad you have chosen our city for this particular meeting. The time is ripe for your best thoughts, and there is now a healthful reaction from the strenuous concentration of war times and war work.

Your program promises an interesting session, and furthermore, you may get some thoughtful waves from across the street where our friends are holding an important convention at this time and at this hour. We feel here in Cincinnati that you are bringing us something worth while. We have looked forward with great pleasures to your coming, and those of the Cincinnati physicians who will have the pleasure of attending your meetings will be sure to gain inspiration and knowledge from your assembly.

As Mayor Galvin has told you, the medical profession has made

wonderful progress in this vicinity during the last ten years. We have not only built several new hospitals, and very fine ones, but we have a splendid medical college. Sometimes I think we are a little vain glorious of our material progress, but if any of you saw our old Cincinnati Hospital, and knew of our numerous and various medical colleges, and if you are able to make a contrast between then and now, I am sure you will concede that a little bit of pride is pardonable in the new order of things. We do feel, however, that we have just reason to be proud of the new spirit that is given to the medical profession with these material things, with our better facilities for teaching, and the splendid teachers that we have. We feel that the medical profession has been given a brighter, broader, and bigger outlook upon our work and our lives. However, it is not meet that I should enumerate the good things which Cincinnati has to offer you. You will probably not miss any of them. The officers and members of the Cincinnati Academy of Medicine will hold themselves in readiness at any time to be of any service to you, and I am sure that I voice their sentiments with mine when I say again that we will give you the best we have and bid you a hearty welcome. We hope that your stay here will be replete with intellectual, scientific, and social pleasure, and we trust when your work is done and you leave us, you will carry away only pleasant and profitable impressions of your Cincinnati meeting. (Applause.)

RESPONSE TO THE ADDRESSES OF WELCOME BY DR. EDWARD A. WEISS.

Mr. President, Mr. Mayor, Dr. Crotty, and Fellow Members of the American Association of Obstetricians and Gynecologists: On behalf of the Association, I wish to say that we accept the courteous and warm addresses of welcome that have been extended to us by the speakers of your fair city.

This association has had many enjoyable meetings. Some of them have been noted for their particular eloquence displayed, some for their unusual attendance, and others for the unusual excellence of the papers presented; but each one seems to have some particular outstanding feature at every meeting. The members of the association derive great benefit from the papers and discussions, and it seems that one meeting tries to surpass the others.

It is not unreasonable that we should look forward with great pleasure to our meeting here this year, for Cincinnati has a particular claim on this association, or rather this society has a particular claim on this city, because, as one of the speakers has said, the first meet-

ing was held in Cincinnati. The first president of the organization was, I believe, a member of your association. I may add, too, that our present president is a native of Cincinnati, a fact which goes to prove that chickens come home to roost. (Laughter.)

Our association has done a great deal in the annuals of surgery and gynecology. Possibly it is one of the foremost societies in the subject of gynecology, obstetrics, and abdominal surgery. Its transactions are to be found in the best medical libraries of the world. Our meetings are always well attended, and a spirit of professional good fellowship is manifested at all times. Its achievements are due in a large measure to the splendid energy and cooperation of all of the members, particularly of some of the Cincinnati members, of whom we have a number in our association, Dr. Bonifield, Dr. Hall, Dr. Zinke, and others. Our achievements, as I have said, have been due in great measure to the energies of these fellows, and many of them to the untiring efforts of that splendid man, that inspiring genius, that perpetual youth, and the best of good friends, our secretary, Dr. Zinke. (Applause.)

That Cincinnati is abundantly able to offer us many comforts during this meeting was illustrated very clearly last week when the American Hospital Association met in this city. It was one of the best assemblies I have ever attended, and I am sure, considering the way in which Cincinnati took care of that meeting, that we shall be well cared for during the sessions of our Association.

Again, on behalf of the organization, I wish to thank the honorable mayor and Dr. Crotty for their cordial addresses of welcome. (Applause.)

RESPONSE TO THE ADDRESSES OF WELCOME BY DR. H. WELLINGTON YATES.

Mr. President, Mr. Mayor, Dr. Crotty and Members of the Association: The introduction given by Dr. Tate to the honorable mayor reminds me very much, in this good old Republican state, of a Republican giving an introduction to another Republican on the platform, and I am glad that it was so well carried out by one I assume to be a Republican mayor.

We are all gratified to know that the mayor of this splendid city so voices the medical profession in general, and, in a special way the, hospital situation. The hospital situation is a very live and ripe one in most of the cities of the country at the present time. We find that the number of beds in most places is not suitable to the popu-

lation and their proper care, and in response I would say, as Mark Antony said in his address to the Roman Senate, "We bring you honorable men." We have come to you in a spirit of some of our deceased men—Murphy, Dorsett, Price. We come to you in that spirit and in the activity of such men as Goldspohn, Carstens, Bonifield, our president, and our beloved Zinke. These men are representative, in a large measure, of the men we have in the medical profession and in this specialty in particular.

We take pride in coming here, as the previous speakers have said inasmuch as this association had its birthplace in Cincinnati. We return here particularly proud of that fact, but are more proud of your splendid institutions and of what you have done and are doing. I am sure that all of those who have not seen Cincinnati and her hospitals, the University of Cincinnati, with its splendid departments, will be interested in visiting them.

We appreciate, Mr. President, that we have come to either the first or the second most musical city in this country, and to a center where music and art have developed as rapidly as in any other place in the country. And thus along with the art of medicine and the science of gynecology, we are glad to come here, and are glad to be welcomed by the mayor and by Dr. Crotty as Vice-President of the Cincinnati Academy of Medicine. We thank you for your warm words of welcome. (Applause.)

Papers were then read as follows:

SYMPOSIUM ON THE WORK OF THE DETENTION HOME FOR WOMEN IN THE MANAGEMENT OF VENEREAL DISEASE.

1. "The work of the detention home for women in the management of venereal diseases," by Dr. Palmer Findley, Omaha, Nebraska.

2. "The value of detention as a reconstructive measure," by C. C. Pierce, Assistant Surgeon-General, U. S. P. H. S., Washington, D. C. (In the absence of the author, this paper was read by Dr. H. S. White, Past Assistant Surgeon of the United States Public Health Service.)

3. "Pioneering in venereal disease control," by A. J. McLaughlin, Surgeon, U. S. P. H. S. (Reserve), Sioux City, Iowa.

4. "The detention and treatment of infected women as a measure of control of venereal diseases in extra-cantonment zones," by Dr. W. F. Draper, P. A. Surgeon, U. S. P. H. S., Richmond, Virginia.

The discussion of this symposium was opened by Dr. F. W. King,

Indianapolis, and continued by Drs. Goldspohn, Carstens, Reder, Bainbridge, J. E. Davis, Keefe, McPherson, Yates, J. D. Miller, Chandler, Pantzer, Bell, M. F. Porter, and Moriarta, after which the discussion was closed by Drs. Findley, White, McLaughlin, and Draper.

Dr. Raleigh R. Huggins, Pittsburgh, moved that a vote of thanks be extended to Drs. Findley, White, McLaughlin, and Draper for their very interesting and instructive papers.

Motion seconded and carried.

On motion, the association took a recess until 2:30 P. M.

Afternoon Session.—This was a joint session with the Interstate Association of Anesthetists. The meeting was called to order at 2:30 P. M. by President Erdmann, Dr. W. I. Jones, Vice-President of the Interstate Assoiciation of Anesthetiats, took the chair.

SYMPOSIUM ON THE ADMINISTRATION OF ANESTHESIA IN OBSTETRICS, GYNECOLOGY, AND ABDOMINAL SURGERY.

5. "Safety factors in the teamwork of operator and anesthetist," by Dr. John J. Buettner, Syracuse, New York.

6. "Some adjuncts which promote efficiency in local and regional anesthesia for major surgery. Illustrated by lantern slides and moving pictures," by Dr. R. E. Farr, Minneapolis, Minnesota.

7. "Surgical barrage," by Dr. Charles W. Moots, and Dr. E. I. McKesson, Toledo, Ohio.

8. "Moving picture illustration of delivery under nitrous oxid anesthesia," by Dr. C. E. Turner, Columbus, Ohio.

9. "Postoperative analgesia," by Dr. Bertha Van Hoosen, Chicago, Illinois.

The symposium was discussed by Dr. Dickinson, and the discussion was closed by Drs. Farr, Moots and Van Hoosen.

On motion, the Association adjourned until 9 A .M., Tuesday, September, 16.

SECOND DAY—*September* 16, 1919.

Morning Session.—The Association met at 9 A. M. and was called to order by the President.

10. "Prophylaxis of gestation," by Dr. Asa B. Davis, New York City.

At this juncture the Secretary read telegrams from Drs. Jennings C. Litzenberg, H. N. Cole, and George Clark Mosher regretting their inability to attend the meeting.

11. "Prenatal care," by Dr. Sylvester J. Goodman, Columbus, Ohio.

12. "The care of the bowels during the puerperal period; a further report," by Dr. Ross McPherson, New York City.

These three papers were discussed together by Drs. Potter, A. J. Skeel, Bill, Yates, Weiss, Pantzer, Burkhardt, A. B. Davis, Baldwin, and the discussion was closed by the essayist.

13. "A method of placing the sutures in immediate repair of the perineum," by Dr. William D. Porter, Cincinnati, Ohio.

14. "Median episiotomy in primiparous labors," by Dr. James A. Harrar, New York City.

These two papers were discussed together by Drs. Carstens, Ed. J. Ill, Goldspohn, Bell, A. J. Skeel, Sutton, Reder, Gillespie, McPherson, and the discussion was closed by the essayist.

15. President's Address: "Incidence of malignancy in diseases of the gall-bladder," by Dr. John F. Erdmann, New York City.

At the request of the President, his address was discussed, the discussion being participated in by Drs. Bainbridge and Noble.

On motion, the Association took a recess until 2 P. M.

Afternoon Session.—The Association reconvened at 2 P. M. and was called to order by the President.

16. "Fundamental repair of partial and complete laceration of the perineum. (Lantern slides showing anatomical features and the technic of the operations)," by Dr. Albert Goldspohn, Chicago, Illinois.

This paper was discussed by Drs. Dickinson, Werder, and Hadden, and the discussion was closed by the essayist.

17. "Observations on the problem of hemorrhage in obstetrical cases," by Dr. Arthur H. Bill, Cleveland, Ohio.

The paper was discussed by Drs. A. B. Davis, Rongy, Potter, McPherson, and in closing by the essayist.

18. "My experience with cases of version during the past year, September, 1918, to September, 1919," by Dr. Irving W. Potter, Buffalo, New York.

Discussed by Drs. Harrar, A. J. Skeel, Rongy, Carstens, Tate, Gillespie, W. D. Porter, Zinke, and in closing by the essayist.

19. "Inversion of the uterus," by Dr. H. Wellington Yates, Detroit, Michigan.

Discussed by Drs. Goodman, A. B. Davis and Rongy.

20. "Cesarean section; its indications and technic," by Dr. Arthur J. Skeel, Cleveland, Ohio.

Discussed by Drs. Potter, Poucher, Rongy, A. B. Davis, and in closing by the essayist.

On motion, the Association adjourned until 9 A. M. Wednesday, September, 17.

THIRD DAY—*Wednesday, September* 17, 1919.

Morning Session.—The Association met at 9 A. M. and was called to order by the President.

21. "Hot flashes of the menopause," by Dr. K. Isadore Sanes, Pittsburgh, Pennsylvania.

Discussed by Dr. James E. Davis.

22. "The cystic ovary," by Dr. Francis Reder, St. Louis, Missouri.

23. "Chronic oophoritis, and cystic ovary," by Dr. Otto H. Schwarz, St. Louis, Missouri.

24. "Case reports," by Dr. Arthur T. Jones, Providence, Rhode Island.

These four papers were discussed together by Drs. Goldspohn, Pantzer, Rongy, Sanes, King, J. E. Davis, and R. T. Morris, after which the discussion was closed by Dr. Reder.

25. "An early case of adenomyoma of the rectovaginal septum; and an adenomyoma," by Dr. Otto H. Schwarz, St. Louis, Missouri.

26. "Protective changes in the Fallopian tubes," by Dr. James E. Davis, Detroit, Michigan.

27. "Treatment of vaginal discharge," by Dr George F. Chandler, Kingston, New York.

These three papers were discussed together by Drs. Darnall, Yates, after which the discussion was closed by Dr. J. E. Davis.

28. "The buried loop operation for retrodisplacement of the uterus," by Dr. John N. Bell, Detroit, Michigan.

Discussed by Drs. Goldspohn, Rongy, G. V. A. Brown, R. B. Hall, W. D. Porter, Jones, Dickinson, and in closing by the essayist.

29. "Clinical facts concerning the stem pessary," by Dr. Thurston S. Welton, Brooklyn, New York.

Discussed by Drs. Sanes, R. B. Hall, Dickinson, and in closing by the essayist

30. "Treatment of peritonitis," by Dr George W. Crile, Cleveland, Ohio.

Discussed by Drs. R. T. Morris, M. F. Porter, A. B. Miller, Dickinson, and in closing by the essayist

31. "A study of certain bands in the right upper abdominal quadrant," by Commander William Seaman Bainbridge, U. S. Navy, R. M. F., New York City.

Discussed by Drs. Reed, Pantzer, R. T. Morris, and Dickinson, the discussion was closed by the essayist.

On motion, the Association took a recess until 2 P. M.

Afternoon Session.—The Association reconvened at 2 P. M. and was called to order by the President.

32. "Syphilis: a cause of delayed healing in noninfected abdominal incisions," by Dr. William E. Darnall, Atlantic City, New Jersey.

Discussed by Drs. Keefe, Bell, R. B. Hall, R. E. Skeel, T. B. Noble, Erdmann, W. D. Porter, Bainbridge, and Pantzer; the discussion was closed by the author of the paper.

33. "Abscess of the liver," by Dr. John W. Keefe, Providence, Rhode Island.

Discussed by Drs. Crile and Pantzer.

34. "The treatment of gunshot wounds of the abdomen," by Dr. John D. S. Davis, Birmingham, Alabama.

35. "A discussion on the myœnteric nerve net," by Dr. Gordon K. Dickinson, Jersey City, New Jersey.

36. "Short incisions versus long incisions," by Dr. Robert T. Morris, New York City.

Discussed by Dr. Sanes and in closing by the essayist.

37. "Some lessons from the war for abdominal surgeons and others," by Dr. Roland E. Skeel, Cleveland, Ohio.

Discussed by Drs. Crile, Hall, Wetherell, Bainbridge, and in closing by the essayist.

38. "The cancer significance of mammary adenoma," by Dr. William J. Gillette, Toledo, Ohio.

39. "Cancer in women; educational campaign among the laity and the medical profession," by Dr. Andre Crotti, Columbus, Ohio.

40. "Tumors of the breast, based on a study of sixty-four cases personally observed," by Dr. Miles F. Porter, Fort Wayne, Indiana.

This series of papers was discussed by Drs. Moseley (by invitation) R. E. Skeel, and Van Hoosen, after which the discussion was closed by Dr. Porter.

41. "The varieties and treatment of dysmenorrhea," by Dr. J Henry Carstens, Detroit, Michigan. (Read by title only.)

INSTALLATION OF OFFICERS.

The retiring President, Dr. Erdmann, before presenting his successor, Dr. Crile, thanked the Fellows of the Association for their courtesy and for their active participation and coöperation throughout his term of office.

Drs. A. B. Miller and Miles F. Porter were appointed as a committee to escort the newly elected president, Dr. George W. Crile, to the platform.

President Erdmann, in presenting his successor, said that he needed no introduction.

Dr. Crile, in accepting the presidency, said:

Mr. President, and Fellows of the American Association of Obstetricians and Gynecologists: First of all, let me state that I consider the post to which you have elected me a very high honor, and in undertaking the difficult task of trying to conduct the duties of the office in the way in which they have been conducted during the past year and in previous years by my distinguished predecessors, I shall require your assistance. I appreciate deeply the great honor you have paid me, and I shall endeavor to do all I can to discharge my duties. I thank you. (Applause.)

THE SECRETARY.—We have lost two Fellows during the past year. The "In Memoriam" with reference to Dr. Julius H. Jacobson has been written by Dr. Charles W. Moots, of Toledo, and is in my hands. The "In Memoriam" with regard to Dr. August A. Strasser has not been received, but it will be within my hands in a short time. Both of these memorials will appear in the Transactions.

Dr. A. B. Miller moved that a vote of thanks of the Association be tendered the local Committee on Arrangements, the Cincinnati Academy of Medicine, the Cincinnati Obstetrical Society, and the management of Hotel Gibson for the manner in which the Fellows of the Association and their ladies were accommodated and entertained during the present session.

Dr. C. L. Bonifield seconded the motion, which was unanimously endorsed by all present.

On motion, which was duly seconded and carried, the Association adjourned *sine die*.

E. GUSTAV ZINKE, M.D., *Secretary*.

EXECUTIVE SESSION.

Monday, September 15, 1919.

The president, Dr. John F. Erdmann, in the Chair.

THE PRESIDENT.—The first order of business is voting on the candidates recommended by the Executive Council for election.

THE SECRETARY.—At the meeting of the Executive Council, held last evening, the following candidates were recommended

favorably to the Association for election: Dr. Herbert W. Hewitt, Detroit, Michigan; Dr. James K. Quigley, Rochester, New York; Dr. Arthur Stein, New York City and Dr. Stephen E. Tracy, Philadelphia, Pennsylvania.

THE PRESIDENT.—What will you do with these applications for membership which have been recommended by the Executive Council?

DR. JOHN N. BELL.—I move that they be elected unanimously.

Seconded and carried.

THE SECRETARY.—At the meeting of the Executive Council last evening, Dr. Erdmann moved that all candidates for admission to the Association hereafter must be graduates of not less than five years standing, and must be teachers or visiting or assistant visiting surgeons to some standardized hopsital. (To lie over until next year.)

DR. JAMES E. DAVIS.—I move that the resolutions be accepted.

Seconded and carried.

DR. CHARLES L. BONIFIELD.—I move that Section 3 of the Constitution which reads, "All candidates for active fellowship shall submit to the Executive Council, at least *one* month before the annual meeting, an original paper relating to abdominal surgery, obstetrics and gynecology," be changed to read, "all candidates for active fellowship shall submit to the executive Council *nine* months before the annual meeting an original paper relating to abdominal surgery obstetrics, and gynecology." (To lie over until next year.)

THE SECRETARY.—I move its acceptance.

Seconded and carried.

The Secretary called attention to the deaths of Drs. Julius H. Jacobson and August A. Strasser during the fiscal year, and said appropriate memorials of these deceased Fellows would appear in the Transactions.

THE PRESIDENT.—The next order of business is the reports of the Secretary and Treasurer.

The Secretary presented these reports.

The President appointed as an Auditing Committee Drs. Hugo O. Pantzer, A. B. Miller, and Gordon K. Dickinson, to audit the accounts of the Secretary and Treasurer.

Adjourned.

Tuesday, September 16, 1919.

The Second Vice-President, Dr. H. Wellington Yates, in the Chair.

THE VICE-PRESIDENT.—The first order is a report from the Auditing Committee.

DR. PANTZER.—The members of the Auditing Committee have carefully examined the books and accounts of the Secretary and Treasurer, and find them correct, with a balance on hand of $1798.67.

THE VICE-PRESIDENT.—What will you do with the report of the Auditing Committee?

DR. BONIFIELD.—I move that it be received and placed on file.

Seconded by Dr. Carstens and carried.

DR. A. B. MILLER proposed the name of Dr. Byron Stanton, of Cincinnati, one of the founders of the Association, for honorary membership.

Motion seconded by Dr. Rufus B. Hall and unanimously carried.

Dr. Stanton thanked the Association most cordially for the great honor conferred upon him.

THE VICE-PRESIDENT.—We will now proceed with the election of officers. The first office is that of President. Nominations are in order.

DR. BONIFIELD.—This Association has many distinguished members. It has many members it has delighted to honor in the past, but it has one member now that we believe, above all others, who will honor us by gracing the chair of president. This man is well known, not only in America, but all over Europe, and he is Ohio's first surgeon. Every doctor in Ohio is glad to say that he comes from the same state as George W. Crile. I therefore nominate Dr. Crile for president of this Association. (Applause.)

DR. WILLIAM E. DARNALL.—I desire to second the nomination of Dr. Crile.

THE VICE-PRESIDENT.—Are there any other nominations?

DR. BONIFIELD.—I move that the rules be suspended and that the Secretary be instructed to cast the ballot of the Association for Dr. Crile as president.

Seconded and carried.

The Secretary cast the ballot as instructed and Dr. Crile was declared duly elected president.

THE VICE-PRESIDENT.—The next order is the election of a first vice-president.

DR. RUFUS B. HALL.—I wish to present the name for Vice-President of a man who has labored for the advancement of this Associa-

tion, who has done excellent work, and is known not only to the members of this Association but to members of the medical profession throughout the country—Dr. Palmer Findley, of Omaha, Nebraska.

The nomination was supported by several.

Dr. Bonifield.—I move that the rules be suspended, and that the Secretary be instructed to cast the ballot of the Association for Dr. Findley as first vice-president.

Motion seconded and carried.

The Secretary cast the ballot as instructed and Dr. Findley was declared duly elected.

The Vice-President.—Nominations for a second vice-president are in order.

Dr. John W. Keefe.—I have the honor to present the name of a man who has crossed the continent several times to give us papers. I nominate Dr. David Hadden, of Oakland, California.

Dr. Bonifield.—I move that the rules be suspended, and that the Secretary be instructed to cast the ballot of the Association for Dr. Hadden.

Seconded and carried.

The Secretary cast the ballot as instructed, and Dr. Hadden was declared duly elected second vice-president.

The Vice-President.—The office of Secretary is now open for nomination.

Dr. Edgar A. Vander Veer.—I wish to nominate the present Secretary, Dr. Zinke, for reelection, and move that the rules be suspended, and that the First Vice-President cast the unanimous vote of the Association for Dr. Zinke as Secretary.

Seconded and carried.

The Vice-President cast the ballot as instructed, and Dr. Zinke was delcared duly elected Secretary.

The Vice-President.—The next office to fill is that of Treasurer.

Dr. John F. Erdmann.—I move that the present incumbent be reelected.

Seconded and carried.

Dr. Bonifield.—I move that the rules be suspended, and that the Secretary be instructed to cast the ballot for Dr. Hayd as treasurer.

The Secretary cast the ballot as instructed and Dr. Hayd was declared duly reelected as treasurer.

The Vice-President.—Filling two vacancies in the Executive Council.

THE SECRETARY.—The terms of Drs. Pantzer and Pfaff expire as members of the Executive Council. The retiring president becomes a member of the Executive Council, and one man must be elected in addition.

DR. BONIFIELD.—The Executive Council is a very important part of this Association; in fact, it is the hub of the wheel. We have very many good men who will fit into the hub beautifully, but we hesitate to try experiments when not necessary. Dr. Pantzer has been in the Council for a number of years; he has done admirably well. There is no one whose advice is more often accepted than his, and I for one would feel much chagrined if he were not elected to succeed himself. Therefore, I take great pleasure in nominating him to succeed himself as a member of the Executive Council.

Motion seconded by several.

DR. CARSTENS.—I move that the rules be suspended, and that the Secretary be instructed to cast the ballot for Dr. Pantzer.

Seconded and carried.

The Secretary cast the ballot as instructed, and Dr. Pantzer was declared duly elected.

DR. KEEFE.—Some of the younger men and some of the founders of the Association have thought it might be wise to change the name of the Association. At times, we have been asked whether we are members of the American Medical Association, and we have to explain why this Association was formed. While we all feel a good reason for the formation of the Association, and while obstetrics and gynecology were the principal purposes for which it was founded, the development of abdominal surgery has been so great within the past fifteen or twenty years that we are asked, at times, if this is an association of obstetricians and gynecologists, how is it that we have papers on gall-bladder surgery, on appendicitis, and on other subjects of this type? Now we do have papers, as we should have, on gall-bladder surgery and on appendicitis, or on any abdominal disturbance, so that it has been thought advisable and desirable to call this association "The American Association of Abdominal Surgeons, Obstetricians, and Gynecologists," rather than the name we have at present, and I wish, therefore, to present a resolution to-day to that effect, with the understanding that this resolution shall hold over for a year. We can discuss the matter in the meantime, and at the next meeting we may decide whether we wish to make that change or not. (To lie over until next year for action.)

DR. BONIFIELD.—I am heartily in favor of this change because it explains exactly the subjects that we have considered. I believe

it is nothing more than right, and it will be a more distinctive name. The one we have is confused sometimes with that of the American Gynecological Society, and we would like to have this name changed. (Carried.)

Dr. Miles F. Porter.—I have a matter which I think is of considerable importance to present at this time in the form of preambles and a resolution, as follows:

Whereas, the conservation of health is a question of paramount importance, and

Whereas, efficiency in this direction requires the correlation of all forces and standardization of methods, therefore, be it

Resolved, That this Association recommends the formation of a federal health administration.

I should like to add that it appears to me that if it meets with the support of the Association, I have no doubt that a report of our action here should be sent speedily to Washington.

The resolution was supported by Drs. Carstens and Bonifield, and carried.

The Vice-President.—The next order of business is the selection of place for the next meeting.

The Secretary.—We have received a most urgent invitation from Cleveland, as well as one from Columbus, Ohio, and from several other places where there are no Fellows.

Dr. Magnus A. Tate.—I move that the time and place of meeting be left to the Executive Council.

Seconded and carried.

As there was no further business to come before the executive session, on motion, which was duly seconded and carried, the executive session then adjourned *sine die*.

E. Gustav Zinke, M.D., *Secretary*.

During the Executive Session of Tuesday, September sixteenth, immediately after Bryon Stanton of Cincinnati, had been elected an Honorary Fellow of the Association, Dr. E. Gustav Zinke arose and addressed the members as follows:

"THE HONOR, INTEGRITY, STRENGTH, AND LONGEVITY OF THE AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS.

"Every great nation, every important organization, like every individual of more or less distinction, has admirers and enemies. It has been said that the greatness of a nation, the importance of an

organization, and the value of an individual may be judged by the number and prominence of their enemies. Our Association is no exception to this rule. We have good friends and true admirers, as well as honest adversaries and superior, tricky enemies. A friend is not necessarily an admirer; an adversary is not always an enemy. The latter is, perhaps, productive of more real and lasting good than the former, provided we recognize and do not underestimate him.

"When this society was organized, thirty-two years ago, its opponents predicted that it would not last five years. But after it had out-lived five years, they declared that the organization would die before ten years passed. When we reached the age of twenty years, all of those who did not wish us well expressed surprise at our growth and development, our work and strength; and now that our Association is completing its thirty-second year, many of our former adversaries and enemies have changed into silent friends and admirers. Why? Because this Association has strictly minded its own affairs, and the majority of its fellow have worked faithfully and persistently in the interest of suffering mankind, jealously guarding the honor of the organization, and diligently seeking the welfare of fellow members.

"To illustrate most effectively the object of what I presently intend to do, permit me to relate an interesting little story—one that is told of the Black Prince of England, famous during the fourteenth century. A great many things have been said about him, most of which are, probably, authentic; at any rate, I am willing to believe in the truth of the tale I am about to tell you.

"Quoting solely from memory, for I have long since forgotten when and where I have read it, the Black Prince is reputed to have been a fearless, high-spirited, and magnanimous man; a warrior in the best sense—a man of action rather than of words. During his youth he avoided the society of women and thus gained for himself the reputation of being a 'woman-hater.' He was rarely present at court festivities; and when he attended, he was a quiet spectator, conversing with men only, and shunning the gentler sex almost to the point of offense.

"On one of these festive occasions, to the surprise of all present, he asked a very pretty young princess, who was newly-arrived, to dance with him. He was shyly, but gladly, accepted. Everybody noted the incident in amazement, wondered what it meant, and marveled at the grace and gentleness of both prince and princess. When the music stopped, royalty and lesser nobles immediately clustered around the distinguished couple. When the music began

to play, they again danced together. Thus they continued, until suddenly a very annoying, though trivial incident interrupted the pleasure of the evening, and brought the ball to a close.

"This is what happened: As the music started anew, and as the Black Prince and his charming beauty began to dance, one of her garters fell to the floor. It was immediately observed, as is usual in such an occurrence, at first by few, but soon by all. The embarrassment increased as mocking smiles grew into annoying grins, and ill-suppressed giggles into loud laughter, when the Black Prince stooped, picked up the garter, and, with a respectful bow, moved to return it to the innocent, perplexed, and trembling young lady. He instantly perceived the shocking absurdity of the situation, and the malicious insinuations of some of the spectators. Instead of offering the garter to the princess, who stood before him speechless from excitement and confusion, with head bent low, and a deep blush of shame upon her face, he straightened himself, and, with head erect, held the garter high up to the gaze of all, bade the music stop, and looked sternly into the faces of those around him until laughter and giggles had subsided, and every smile had disappeared from the faces of the audience. When the hall had become as silent as a grave, he exclaimed in a clear and solemn voice: '*Honi soit qui mal y pense!*' Offering his arm to the distressed lady, the pair walked from the hall, leaving the evil thinkers and gossipers to themselves.

"The incident caused the establishment of the Order of the Garter, the highest dignity conferred by the Court of St. James, with the words just quoted inscribed upon its insignia.

"For nineteen years I have been a fellow of this Association; and for eight years your secretary. During all this time I have become intimately acquainted with the *raison d' être* for, and the origin and object of the existence of our society. Most of you, too, are familiar with the character of the work that has been done in the past by the Association, the opposition it has to conquer, the nature of the attacks it had to endure, and the noble and dignified manner in which it has upheld its honor and maintained its self-respect.

"Ours is a thoroughly democratic organization, composed of the purest Americanism, old and unalloyed in character. There is no snobbery in our midst. We stand solely for what is good, true, and fair to our fellow-men. We are still jealous of our reputation, and always ready to uphold our worth at all times. The truth is, we actually love some of our enemies, and have done good to not a few who have spitefully pursued us in bygone days.

"This is our third meeting in the Queen City of the West. During the preceding thirty-one meetings of this Association, every subject pertaining to obstetrics, gynecology, and abdominal surgery has been presented in original and well-prepared, scientific papers; and every contribution has been thoroughly discussed from all points of view. Many theories and practices, at first new, but now fully approved, were evolved and finally settled by this Association. We may well look with pride and satisfaction upon the work the Association has accomplished. It will be our constant endeavor to maintain the high standard we have set for ourselves, and faithfully to persist in doing only honest, useful and substantial work for the benefit of suffering humanity.

"Though I am neither king, prince, nor other potentate, and though I lay no claim to the so-called 'nobility of birth' except that which is derived from the humblest and simplest of life, I have taken it upon myself to perform this evening what I hope you will regard an act as honorable and dignified as any ever performed by the most exalted and anointed of crowned heads. The principal object of this movement is to bring us more closely together in heart and soul in order that we may continue to battle successfully for the prosperity, longevity, and, above all, for the honor of the American Association of Obstetricians and Gynecologists.

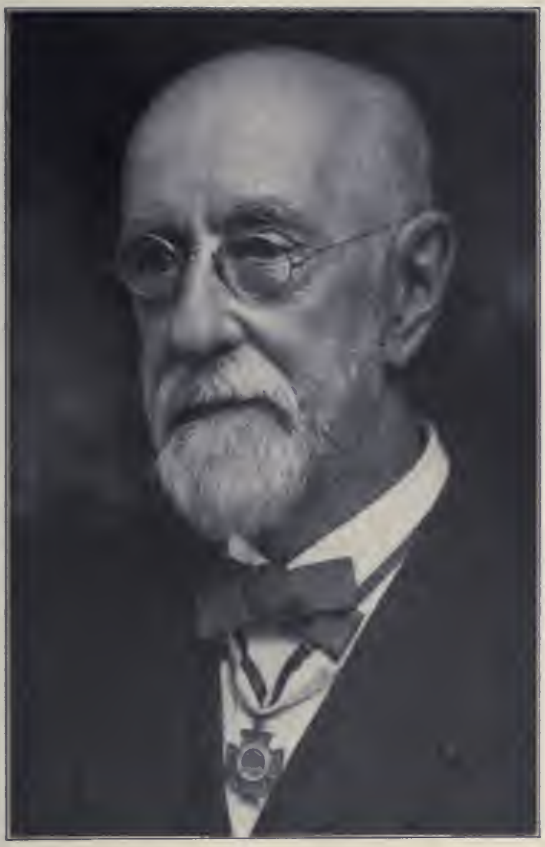
"To seal this resolve I have designed a plain and inexpensive order which shall be the symbol of the motives and purposes just expressed. It is intended that this little badge be worn only on festive occasions, like the present. Trusting you will value it for its intent, rather than its intrinsic value, I hand it to you, in the manner of the Black Prince, saying:

'L' honneur est comme une île,
Escarpée et sans bord;
On n'y peut plus rentrer
Dès qu'on en est dehors.'

"For the benefit of those not familiar with the French language, permit me to render this jewel of a stanza into plain, pure American:

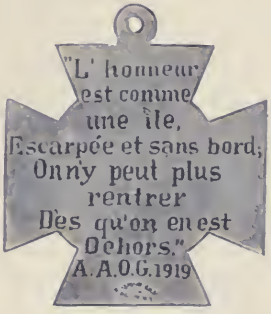
Honor is like an island,
Steep and without protecting rail;
Those who abandon it,
And seek to return, will fail."

After finishing his address, Dr. Zinke walked toward Dr. Byron Stanton and presented him with the Badge of Honor suspended from a red, white and blue silk ribbon. He then distributed the order to every Fellow present.



Dr. Byron Stanton, Honorary Fellow of the Association.

Obverse



Reverse

PAPERS

READ AT THE

THIRTY-SECOND ANNUAL MEETING

OF THE

AMERICAN ASSOCIATION

OF

OBSTETRICIANS AND GYNECOLOGISTS

HELD AT THE

GIBSON HOTEL

CINCINNATI, OHIO

SEPTEMBER 15, 16, AND 17, 1919

ADDRESS OF THE PRESIDENT.

INCIDENCE OF MALIGNANCY IN DISEASES OF THE GALL-BLADDER.

BY

JOHN F. ERDMANN, M. D., F. A. C. S.,

New York, N. Y.

GUESTS and Fellows of the American Association of Obstetricians and Gynecologists: I have the pleasure, in the full sense of the word, of extending to you my cordial greetings as president of this prominent scientific body, and of assuring you that I am deeply affected by the honor bestowed upon me at our last meeting in Detroit, the city where reading and writing have recently been questioned as essential to either financial success or newspaper notoriety. Little did I think, when presenting my thesis on pancreatitis, and my person, at the last meeting held in this city thirteen years ago, that the pleasure of occupying the chair, even if not of filling it, would be mine.

May I trust that you will not suffer too great a disappointment in my proceeding with a scientific paper instead of the usual presidential address?

During the early part of this year I was startled by the repeated observation of malignancies of the gall-bladder occurring in my private practice. Within a period of six weeks I opened the abdomen for suspected cholecystitis about thirty times and found six malignancies. Within the following eight weeks I saw, in forty-five operations for cholecystitis, three more carcinomata of the gall-bladder. While such an occurrence may perhaps be classed only as a pursuing evil, or a coincidence, nevertheless it gave me much food for thought on the subject of the incidence of malignancy in gall-bladder disease.

For years I had accepted the fact that malignancy of this viscus occurred in about 4.5 per cent. of all gall-bladder operations and was, therefore, forced by the aforementioned occurrence to believe that my reading, observations, and earlier contributions on this subject

were in error, or that I had had a phenomenal run of carcinomata of this zone.

In addition to the malignancy of the gall-bladder, several cases of general carcinomatosis of the abdomen were encountered and in these I felt that, in view of finding the greatest amount of malignant tissue in the hepatic zone, they were also malignancies of the biliary tract; but for want of a better understanding as to origin, I included these cases in my statistics under "unclassified" carcinomata.

In an earlier contribution, on gall-bladder work, published about twelve years ago, I cited a series of 105 operations, five of which were for carcinoma, almost 5 per cent. In a later contribution, about three or four years ago, I failed to take account of the malignancies, as I felt quite sure that the percentage would not exceed 5.

In to-day's report I shall begin with the first half of this year's work which contains nine carcinomatous gall-bladders in a series of sixty-eight operations upon this organ, occurring in an operative list of 502 patients. The first half of the year 1918 presents three malignancies in a series of sixty-three operations on the gall-bladder, out of a total of 491 operations. The second half of 1918 presents but two malignancies of this viscus in forty-seven operations upon the gall-bladder, out of a series of 474 major operations. The last half of the year 1917 gave but one malignancy in forty-seven gall-bladder operations, out of a general operative list of 506. These figures and statements show, in the main, the remarkable occurrence of malignancies in the early months of this year, and go to prove my contention that the malignancies observed in the first portion of this year must be considered a mere coincidence.

Since I am convinced that this period of time would be ample for a relatively satisfactory conclusion on the part of an individual operator, a summary of these cases for the past two years gives the following:

June 15, 1917, to June 15, 1919, number of patients operated upon, 1903. Of these, 224 cases were operated upon for cholecystitis, and in fifteen of them the gall-bladder was found to be malignant, a percentage of 6.7; and 0.8 per cent. of these gall-bladder malignancies were found in my entire operative work during these twenty-four months.

I wish again to emphasize the fact that there were among them thirteen cases of general abdominal carcinomatosis in which the primary focus could not be positively demonstrated; but, in the majority of them, the point of greatest involvement was in

the neighborhood of the gall-bladder. The stomach and adjacent structures were positively not the source of origin.

In the 1903 patients operated upon, malignancies of all kinds, excluding the lip epitheliomata, were found 285 times. Recalling that fifteen of the 285 malignancies were of the gall-bladder, it will be observed that the occurrence of gall-bladder malignancies to the whole number of malignancies is about 6 per cent. The malignancies positively specified in the collection are: gall-bladder, 15; stomach, 43; breast, 66; cecum, 12; colon and sigmoid, 28; rectum and recto-sigmoid, 29; not specifically classified, 79. The seventy-nine unclassified cases include malignancies of the uterus, kidney, larynx, tongue, liver, thyroid, etc.

The ages of patients having gall-bladder malignancy varied from forty-two to sixty-seven. All were females. Malignancies of the gall-bladder I believe to be far more frequent in the female than in the male. Cholecystitis, likewise, presents itself more frequently in the female. Malignancies of the duct, pancreas, and papilla, however, occur more frequently in the male.

Through the kindness of the Registrar of the New York City Board of Health, Dr. W. H. Guilfoy, I am able to present a few of the data of deaths from malignancy in 1918 in New York City. Unfortunately no line was drawn by the Health Department between gall-bladder and liver cases; all were recorded under the title of "Liver and Gall-bladder." Among this class of cases, 192 died out of a list of 2170 deaths due to cancer. Hence 10 per cent. died of hepatic and gall-bladder malignancies. Of the 192 cases, ninety-seven were females. In the review of the list given by the Board of Health, it is well to know that the majority of these cases were not operated upon. In other words, the autopsies, as well as the examinations made during life, were few as compared with deaths due to other diseases. In another sheet Dr. Guilfoy states that, of the 192 gall-bladder and liver malignancies, four males and two females were subjected to operations, while the remaining 186 received no operative treatment. This calculation bears out my supposition as recorded above.

While malignancy occurs in any decade of life, it manifests itself chiefly in the fourth, fifth, sixth, and seventh. Five of the deaths recorded by the Board of Health during the year 1918 occurred one at 15, one at 24, one at 25, and two in the fourth decade.

In this period of time, the Board of Health records 957 deaths from cancer of the stomach and intestines, of which 516 were males and 441 females.

Thus it may be safely stated that the frequency of cancer of the biliary system occurs in the following order: (*a*) Gall-bladder, cystic duct, and liver. (*b*) Pancreas, with common duct contiguity. (*c*) Common and hepatic ducts. (*d*) Papilla of Vater.

In all of the patients, victims of carcinoma of the gall-bladder, recorded in this communication, stones were found in the gall-bladder. It would seem, therefore, that the presence of gall-stones, or of biliary sand, is a provocative factor in the production of malignancy. If this be true, the early elimination of such irritants is advisable.

While I do not wish to take the ultra-radical stand of advising operation in every gall-bladder affection, nevertheless the statistical side of malignancy, as compared with the operative mortality, should be definitely, clearly, and positively placed before all patients having gall-bladder disease.

It is recognized to-day that the mortality of cholecystostomy and cholecystectomy is well under 4 per cent.; in fact, below 3 and even 2 per cent., in the hands of experienced clinicians; and if it is recognized that the malignant incidence is between 4 and 6 per cent., it can readily be seen that the patient selecting the operative risk has the advantage of avoiding a malignant death by 2 to 3 per cent. Nevertheless, death to all of us is as certain as day, and the selection of the type of demise must be left to the individual after a careful illumination of both sides of the question.

Symptoms.—No definite symptoms of malignancy can be described in the early onset of the disease. When the symptoms point to a cholecystitis, an operation is justifiable for the purpose of relieving the patient of the lesser disease, and of easing the mental state when malignancy, the greater disease, is supected. When the gall-bladder, or the mass in the right hypochondriac region, becomes so large as to be palpable in non-acute cases, with or without a jaundice of the ever-deepening variety, malignancy must be given weighty consideration. Continually increasing jaundice, slow or insidious in onset, is in itself a pathognomonic sign of malignancy; but, as frequently happens, a stone may be painless in its impaction, and the consequent jaundice may not be intermittent in depth of color. A Courovisier gall-bladder can often be felt through the wall of the abdomen; and though it may be tender, it is not painful. Loss of weight is evident only when the malignancy extends to the common duct, pancreas, or adjacent viscera. Many patients who have malignancy of the gall-bladder mention pain as the first symptom; and this symptom is prone to be in evidence, therefore, when the growth has advanced to the inoperable stage.

The operative treatment of this disease deserves rather weighty consideration. I have personally observed that interference with the gall-bladder, unless a complete cholecystectomy can be performed, is prone to be followed by a rapidly fatal issue. By the term "interference" I wish to convey the idea of removing the stones, since they are erroneously believed to be the entire source of pain, and also the doing of a cholecystostomy or cholecystectomy if the growth begins to be, or is established in, the cystic fissure, or if any suspicious metastases are discovered within the surrounding viscera.

A satisfactory ectomy can be done in certain cases of fundus and body of the gall-bladder involvements. These are the cases found, as a rule, as accidentals to the operation for cholecystitis.

Excisions of sections of the common and hepatic ducts have been done frequently enough to stimulate further efforts in this direction. While resection of the head of the pancreas has been beautifully illustrated by various experimental operators, the mortality in the human subject has been so high as to render this operation practically prohibitive.

The involvement of the papilla and ampulla is best overcome by a cysto-gastrostomy; when the growth of the papilla is obstructing the duodenum, then a gastroenterostomy is added; thus we rely upon a back-track current of the bile and pancreatic juice by way of the common to the cystic duct, to the gall-bladder into the stomach, and then into the intestines by way of the new stoma. Such operations as the two above described have been reported by Dr. C. G. Heyd and by me in the *American Journal of the Medical Sciences*, in August, 1916, under the title of "Relief of Chronic Obstructive Jaundice;" and again, by me, in the *Annals of Surgery*, March, 1918.

The youngest of my series of this type of involvement was a male eighteen years of age, who had an obstructive carcinoma at the papilla of Vater, also obstructing the duodenum. The combined operation of cystogastrostomy and gastroenterostomy, with excision of a large gland at the mid-portion of the duodenum and repair of a hole in the duodenum, due to pressure necrosis, was successfully done. The boy lived more than twenty-two months.

A close review of the statistics herewith presented will, I am convinced, justify the advice that an established diagnosis of cholecystitis predicates the possibility of occurrence of cancer, almost double that of the possibility of a mortality in case of operation.

DISCUSSION OF THE PRESIDENT'S ADDRESS.

COMMANDER WILLIAM SEAMAN BAINBRIDGE, New York City: It is not customary, I believe, to have any one discuss the presiden-

tial address, and I certainly did not expect to be called upon to do so, but I gladly respond, and congratulate the author.

We have been looking forward to this paper by Dr. Erdmann, with much pleasure. He has been a great contributor to gall-bladder literature, and has given us guiding facts in relation to diseases of the upper right abdominal quadrant.

I congratulate myself, and I think I voice your sentiments when I congratulate you, on having heard this scholarly presentation of practical facts.

The great question which we have been fighting, most of us, in the last few years, has been international malignancy. Now, we are coming down to national and individual malignancy, an unsolved problem in both cases needing our attention. The number of cases which we have seen at the New York Skin and Cancer Hospital and elsewhere during the last fifteen years has taught the lesson over and over again that, when in doubt, do not stand still, but explore. Look in and see! Some cases that seemed absolutely hopeless and have been diagnosed as diffuse, abdominal, inoperable carcinomatosis have proved to be something else. One should try to get in early enough to take care of the malignancy and any other conditions coincidentally present.

Dr. Thomas B. Noble, Indianapolis, Indiana.—I have always been stimulated and entertained by contact with our President in his words as well as deeds. So I feel good to have heard this address. It has relation to the great thing of all things that is before the therapist today—the thing malignancy. The bacteriologist, the pathologist, the clinician has failed in giving us the causation, and the world is groping to-day in as great darkness relative to the real cause of cancer as it ever was. And cancer is on the increase. The testimony, given by men who are handling people who are sick, and universal statistics are favorable to the increase of cancer. Those of us who are on the front line, not knowing its cause, but who are having to contend with it, seeing it every day in all its aspects, must be always interested when the subject is brought before us, and we who are on the front line fighting the battles of humanity for the betterment of the flesh can do very little except to pay heed to what the President has said, and unfit, if you please, the organism for the development of this terrible malady by taking away from it the ground upon which it grows. The ugly dangerous uterus, or the suspicious lump in the side, or the ovary, the known and suspected ulcer of the stomach, the continuing symptoms, vague though they be, of trouble in the upper right quadrant of the abdomen, all should be associated with the possibility of an ultimate malignant disease and should be taken care of. The removal of the ground upon which the malignancy develops will bring down the mortality of one in seven; and so the lesson, the great truth, that we have had a greater mortality resulting from the development of cancer in known gall-bladder disease than from those cases in which proper operative procedures were employed, will lessen this disease.

SYMPOSIUM

ON

THE WORK OF THE DETENTION HOME FOR WOMEN IN THE MANAGEMENT OF VENEREAL DISEASES.

CONTROL OF VENEREAL DISEASE IN DETENTION HOMES FOR WOMEN IN TIMES OF WAR AND PEACE.

BY

PALMER FINDLEY, M. D.,

Omaha, Neb.

THE time has come for consideration of the question of the control of venereal diseases in times of peace. Much good has been accomplished throughout the period of the war by the Federal Government and local authorities in the control and treatment of women afflicted with venereal disease and now we are squarely confronted with the problem of continuing the work.

In many localities the work has been wholly abandoned and, so far as I am informed, there are few places where there has not been a decided relaxing in the efforts to detain and treat these cases.

All reforms go in waves. It is evident that we are now at low tide. This condition is not due to any lack of interest or effort on the part of the Federal or local authorities; it exists because the Government has not provided the means for the exercise of authority over these institutions and over the communities in which they are located. It is not enough to lend advice and encouragement. There must be a compelling force behind reform, if the work is to be carried on effectively. The moment the armistice was signed the Federal authorities, at least in this locality, ceased to function. They expressed their desire to see the work continued and proffered their moral support; but that was not enough. The military police ceased to coöperate with the city police in controlling the situation, and the public was not slow to recognize that military interference, in local affairs, was at an end. The result was that few cases were brought into the Home, and there was increasing difficulty in obtaining and detaining inmates.

I am firmly convinced that the work so splendidly begun will remain at its present low state of efficiency until laws are enacted which will place these Homes under the direct supervision of the Government. Local authorities, unsupported by the Federal authorities, cannot control the situation. I believe we had the moral support of the public at large in the work while the work was on; but the public will soon forget, and the deadly ravages of venereal disease will proceed unheralded and unrestrained, unless our Government can find a way to solve effectively the problem; and the solution of the problem rests in centralized authority.

In the October number of the AMERICAN JOURNAL OF OBSTETRICS (vol. lxxx, No. 3), I have given a report of the work done in the Detention Home for Women in Omaha. This report was read before the American Gynecological Society, in Atlantic City, last May. Work in the Detention Home has been continued up to the present, but with little support. The local authorities have made every possible effort in the prosecution of the work; but there are manifest difficulties which have not been overcome, with the result that our efforts have suffered.

There is no intention on the part of the local authorities to discontinue the work. They realize that the few inmates of the Home do not justify the maintenance of a fairly large overhead expense; but they are impressed with the importance of continuing the project in the hope that it may later be possible to obtain the necessary support to make the labor worth while.

I will not repeat what has been so recently published relative to our institution in Omaha (see AMER. JOUR. OBST., Oct., 1919). The men who are associated with me in this symposium will bring to you their experiences and their plans for the continuation of the enterprise in these times of "peace when there is no peace." These men have done a great work, while the work was on, and we shall do well to heed their advice.

THE VALUE OF DETENTION AS A RECONSTRUCTION MEASURE.

BY

C. C. PIERCE, M. D.,

Ass't Surg. Gen., U. S. P. H. S.,
Washington, D. C.

(By Invitation)

THE value of detention as a reconstruction measure should be of vital interest to the American Association of Obstetricians and Gynecologists, for it is to this group of the profession more than to any other except, possibly, the psychiatrists, that society must look for the development of this phase of the peace-time program that has to do with the prevention and control of venereal diseases.

Many of you are no doubt familiar with Sections 12 and 13 of the Selective Service Act. These two sections have perhaps surpassed anything thus far known in national legislation.

Section 12 prohibited the distribution of liquor to troops; Section 13 suppressed prostitution, not only in the immediate vicinity of camps, but within a zone whose limits were from five to ten miles surrounding each mobilization center, and further where the necessity for extension presented itself. To enforce these laws was no small task. The offenders, as well as their protectors, were extremely difficult to manage. The Law Enforcement Division of the Commission on Training Camp Activities, which was organized in September, 1917, was given the responsibility of enforcing the law contained in these two remarkable sections. The work in connection with Section 13 is the one to which I shall confine myself.

In September, 1917, when the Commission was formed, a committee on protective work for girls was created as one of the constituent parts of the Commission. The function of this committee was to provide protection for young girls in the mobilization areas, on the assumption that these girls needed protection to keep them from becoming sex offenders. Six months' work demonstrated that the number of delinquent girls in the vicinity of military camps was so great that a reorganization of the committee on a new basis was necessary. In April, 1918, the Section on Women and Girls

was created as a part of the Law Enforcement Division of the Commission on Training Camp Activities authorized to deal primarily with women and girls who were sex offenders. The protective work and recreational work with the girls who were not sex offenders was left to local organizations.

One of the first and most prominent problems confronting the Commission was how to provide detention for women and girls arrested under this act. It is to be borne in mind that the cantonments were, with but few exceptions, located in comparatively small Southern cities where proper custodial care, even for ordinary offenders, was quite undeveloped. To meet this emergency the President set aside from his War Emergency Fund, generally spoken of as the National Security and Defense Fund, the amount of $250,000 to provide suitable facilities for the custody and rehabilitation of girls and women who were a menace to the man in training. A special section was added to the Commission on Training Camp Activities, known as the Section on Reformatories and Detention Houses.

That the offenders arrested under Section 13 were mainly prostitutes is clear and that they should be found infected with venereal disease is likewise obvious. Medical supervision then became the most important service in these detention homes created in the extra cantonment zones. The Public Health Service assumed the responsibility for the care of these delinquents. Very little attention was paid during the war to reconstruction work, because of the urgent necessity of other phases of the matter and the lack of adequately trained personnel.

Practically all the detention stations so established were of an emergency nature, as immediate action was necessary to meet the unusual situation that had been created. In a few instances it was possible to arrange with already existing institutions to admit and care for the persons held for detention, but this condition was the exception rather than the rule. In fact, during the year 1918 there were only about eight states that were making provision for the detention of venereally infected women, other than by confining them to county and city jails. Only one state had any provision for the detention of colored women.

As a result of the efforts of the various Federal agencies, thirty-four states provided more or less adequate detention measures for persons infected with venereal diseases, these being established in the towns and cities given in the list which follows:

STATES AND CITIES IN WHICH DETENTION MEASURES WERE INSTITUTED THROUGH FEDERAL REPORT.

ALABAMA:
Anniston Detention Hospital, Anniston.
Montgomery Detention Hospital, Montgomery.

ARKANSAS:
Little Rock Detention Hospital, Little Rock.

CALIFORNIA:
Los Angeles, Juvenile Hall.
Los Angeles, Los Feliz Detention Hospital.
Oakland, Walnut Creek.
Sacramento.
San Bernardino, County Hospital.
San Diego, Mission Valley Hospital.
San Francisco.

CONNECTICUT:
New London, State Farm for Women, East Lyme.

GEORGIA:
Augusta Detention Hospital, City Stocade.
Atlanta Detention Hospital.
Detention Hospital, Pinecrest, Buckhead (near Atlanta).
Grady Memorial Hospital, Atlanta.

INDIANA:
Detention Wards in City Hospital, Indianapolis.
Terre Haute.

IOWA:
Carroll, Detention Hospital.
Council Bluffs Detention Home, Council Bluffs.
Sioux City Detention Hospital, Sawyers Hill, Sioux City.
Des Moines Detention Hospital, Des Moines.

KANSAS:
Kansas Industrial Farm for Women, Lansing.
Detention Hospital for Men, Kansas State Penitentiary, Lansing.
Wichita.

LOUISIANA:
Alexandria Detention Hospital, Alexandria.
Alexandria, Fourth Street Extension.
Detention Hospital, St. Francis Sanitarium, Monroe.
New Orleans, Charity Hospital.

MAINE:
Portland, City Home.

MARYLAND:
Baltimore.

MICHIGAN:
Bay City, Detention Hospital.
Detroit, Canfield Street, Police Detention.
Grand Rapids, DeVores Hospital.

MISSISSIPPI:
Hattiesburg Detention Hospital, Hattiesburg.

MONTANA:
Butte.

MISSOURI:
Leeds, The Reformatory.
St. Louis.

NEBRASKA:
Omaha, Detention Hospital.

NEW JERSEY:
Bayonne.
Newark Detention Hospital, City Hospital, Newark.
Detention Hospital, City Hospital, Jersey City.

NEW YORK:
Amsterdam.
Binghamton.
Buffalo.
Niagara Falls, General Hospital.
Rochester, Municipal Hospital.
Schenectady.
Syracuse.
Troy, House of Good Shepherd.
Valley Stream, Wayside Home for Girls.
New York City, Riverside Hospital, North Brothers Island.

NORTH CAROLINA:
Samarcand, Women's Detention Home.
Wilmington, County Home.

OREGON:
"The Cedars" Detention Home, Portland.

OHIO:
Detention Hospital, Ross County Infirmary, Chillicothe.
Cincinnati, General Hospital.
Cleveland, City Hospital.

OKLAHOMA:
Lawton Detention Hospital, Lawton.

SOUTH CAROLINA:
Greenville.
Columbia House of Detention, Columbia.
Detention Home, Spartanburg.

SOUTH DAKOTA:
Aberdeen, Detention Hospital.

TENNESSEE:
Chattanooga Detention Hospital, Chattanooga.

TEXAS:
El Paso Detention Hospital, El Paso.
Detention Hospital, San Antonio.

Austin Detention Hospital, Austin.
Houston.
Ft. Worth, Detention Hospital.

UTAH:
Ogden, Detention Hospital.
Salt Lake City.

VIRGINIA:
Richmond, City Home, Detention Wards.
Newport News City Farm, Newport News.

WASHINGTON:
Seattle.
Spokane, Rivercrest.
Tacoma, Detention Home.

WEST VIRGINIA:
Charleston, Salvation Army and Union Mission.

Most of these detention homes were temporary structures, and the equipment and personnel varied considerably, depending upon the amount of funds available and the possibility of securing trained workers to perform the duties of matrons and attendants.

Notwithstanding the difficulty attendant upon providing proper detention facilities, these institutions fulfilled a very essential and important function in limiting the spread of venereal diseases in the civilian areas adjacent to army and navy camps.

The establishment of these institutions was received by the local communities in a widely varying manner. In some places the officials and social agencies gave the institutions most cordial and intelligent support, while in others practically no help from the local community could be counted upon.

Some degree of criticism, likewise, was directed toward many of the institutions on account of lack of understanding on the part of the critics of the object to be accomplished. Several articles were written and published in various magazines criticizing the action of the Government in detaining venereally infected women, with the statement that such a procedure was a revival of the plan for regulating prostitution that has for many years been employed in various European countries, and that its effect upon the control of venereal diseases would be unsuccessful.

That such a view was erroneous can easily be shown by anyone familiar with the facts, which showed that the civil and military authorities were confronted with a condition, not a theory; a condition which required the immediate isolation of as many venereally infected persons acting as spreaders of disease as could be quickly

apprehended and quarantined. It was not a measure instituted for the punishment of prostitutes on account of infraction of the civil or moral law, but was strictly a public health measure to prevent the spread of dangerous, communicable diseases.

The law specifically stated that the measures instituted were for the protection of the health of the soldiers and sailors. The soldiers and sailors obviously contracted their venereal infections from infected women. Therefore, for the purpose to be accomplished, it was not necessary to isolate venereally infected men prior to their induction into military service.

The assembly of large numbers of venereally infected prostitutes in these various institutions offered a splendid opportunity for sociological and psychological investigation of the causes of prostitution in general, and of the type of women that furnished the great bulk of prostitutes.

History sheets of more than 9000 individuals were collected among the 30,000 women apprehended during the war. These history sheets are now the property of the Interdepartmental Social Hygiene Board. Up to this time it has not been possible to study and tabulate these history sheets, but it is expected that this work will be accomplished some time in the near future. Undoubtedly, the data so obtained will be of great value to all those interested in the problem of the control of venereal diseases.

Intensive studies were made of two groups of detained women in widely varying states, the data of which are now ready for publication and will shortly appear as a bulletin of the Public Health Service. These studies disclosed some very interesting facts. A few of the details are given in the tables which follow:

DATA CONCERNING 100 WHITE PROSTITUTES FROM 95 FAMILIES.

Birth Place of Parents.

	Fathers	Mothers		Fathers	Mothers
Kentucky	40	44	Indiana	10	1
Tennessee	6	3	Ohio	3	1
Georgia	2	0	Louisiana	1	1
Missouri	1	3	Maine	1	1
Virginia	1	0	West Virginia	1	1
Texas	1	1	Pennsylvania	1	0
Mississippi	0	1	Illinois	0	1
Florida	0	1	Oklahoma	0	1
South Carolina	0	1	Born in U. S. but		
Germany	4	2	state unknown	14	7
England	0	1	Ireland	1	1
Unknown	8	10	Switzerland	0	1

Education of Parents.

		Fathers	Mothers
Could not read nor write		15	9
Could read and write only		38	37
Grades attained	3d	1	0
	4th	1	4
	5th	0	3
	6th	2	2
	7th	0	1
	8th	1	3
	9th	1	5
Entered High School		1	4
Completed High School		0	1
Entered College		2	0
Unknown		33	26
		95	95

Alcoholic Habits of Parents.

	Fathers	Mothers
Habitually alcoholic	31	4
Alcohol used sparingly or not at all	43	76
Alcoholic habits unknown	21	15

GROUP 1.—*Age of subjects at time of mother's death*

Age of subject	5 yr. and under	6–10	11–15	16–20	21–35
Number of subjects	7	3	2	3	2

GROUP 2. —*Age of subjects at time of father's death.*

Age of subject	5 yr. and under	6–10	11–15	16–20	21–35
Number of subjects	5	4	2	5	1

GROUP 3.—*Age of twenty-three subjects at time of death of both father and mother*

Age at death of father:
2: 2: 3: 4: 5: 2: 3: 6: 10: 8: 8: 11: 4: 6: 16: 20: 16: 19: 8: 17: 14: 22
Age at death of mother:
2: 2: 4: 1: 5: 9: 7: 1: 1: 9: 12: 14: 17: 16: 2: 1: 1: 13: 21: 21: 23: 18

GROUP 4.—*Age of subjects at time of parents' separation*

Age of subject	5 yr. and under	6–10	11–15	16–20
Number of subjects	4	4	2	2

GROUP 5.—*Age of five subjects at time of separation and death of parents*

	1	2	3	5	5
Age at separation	9	12	18	8	7
Age at death of father	..	..	19		
Age at death of mother	16	19	..	9	21

Occupation of Parents.

	Fathers	Mothers		Fathers	Mothers
Farmer	43	0	R. R. Car Repairer	1	0
Housekeeper	0	72	R. R. Brakeman	1	0
Laborer	12	0	Fish Peddler	1	0
Factory Worker, Tobacco	2	4	Bookkeeper	1	0
Carpenter	3	0	Painter	1	0
Seamstress	0	3	Coal Miner	1	0
Locomotive engineer	3	0	Machinist	1	0
School Teacher	0	2	Rate Clerk	1	0
Railroad Foreman	2	0	Stationary Engineer	1	0
Physician	2	0	River Pilot	1	0
Mechanic	2	0	City Fireman	1	0
Saloon-keeper	1	0	Brick Mason	1	0
Factory Worker, Wagon	1	0	Motorman, Street R. R.	1	0
Upholsterer	1	0	Blacksmith	1	0
Minister	1	0	Domestic	0	1
Night Watchman	1	0	Milliner	0	1
Shoemaker	1	0	Laundress	0	1
R. R. Switchman	1	0	Clerk	0	1
			Unknown	4	10
				95	95

Ages of Subjects Examined.

Year	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	36	39	41	42	43	44	52
No.	1	7	5	8	10	8	6	10	5	3	5	5	4	2	1	1	3	1	5	2	1	3	2	1	1

Reasons for Detention in the Various Institutions.

Disorderly conduct	61	Petit larceny	1
Quarantine	21	Breach of peace	1
Drunkenness	6	Forgery	1
Conducting disorderly house	4	Begging on streets	1
Grand larceny	2	Contempt of court	1
		Illegitimate pregnancy	1

Total.....100

(Disorderly conduct covers street soliciting and certain other phases of prostitution.)

Previous Arrests of Subjects Examined.

No. of previous arrests	1	2	3	4	5	6	9	17	several
No. of individuals	21	9	4	2	3	3		1	4

Birthplaces of Subjects Examined.

Kentucky	60	Virginia	1
Indiana	13	Oklahoma	1
Tennessee	6	Alabama	1
Missouri	4	Iowa	1
Ohio	4	New York	1
Texas	2	Illinois	2
Louisiana	2	Ireland	1
		Unknown	1
Total	100		

Education of Subjects Examined.

Could not read nor write		7
Could read and write only		22
Grades attained	3d	6
	4th	11
	5th	15
	6th	8
	7th	11
	8th	11
	9th	1
Entered high school		6
Completed high school		2
Course in business school		2

Occupations of Persons Examined.

Factory Worker	36	Milliner	2
Domestic	24	Cash Girl	2
Waitress	15	Musician (Piano)	2
Housework at Home	9	Wrappers (Dept. store)	1
Laundress	5	Bookkeeper	1
Seamstress	2	Stenographer	1
		Total	100

Alcoholic and Drug Habits of Subjects Examined.

Habitually alcoholic	34
Occasional users	27
Both alcohol and morphine	7
Alcohol, morphine, and cocaine	1
Alcohol and paregoric	1

Apparently none were using drugs at time of examination.

Civil Status.

Single	25
Married once	56
Married twice	18
Married three times	1
Total	100

Results of Marriages.

Separations	55
Divorces	4
Separated from one husband	4
Husband dead	8
Living with husband	4

Results of Wassermann Tests.

Negative	1 plus	2 plus	3 plus	4 plus
57	6	8	8	21

Of the 57 women given a negative Wassermann reaction, 4 gave a definite history of syphilis, 1, 12, 16, and 21 years ago respectively, with subsequent treatment; 4 had 4 plus Wassermann reactions during the past 10 months, and 1 had a 1 plus Wassermann 4 months previously.

Results of Microscopical Examinations.

Smears showing presence of gonococci	81
Smears regarded as doubtful	2
Smears not showing gonococci	16
Smear not made	1
Total	100

Mental Examination—Goddard Revision of Binet-Simon Scale.

Binet age under 10 years	41
Binet age of 10 years and under 12	50
Binet age of 12 years or more	9
	100

Psychiatric Classification

Feeble-minded	38
Constitutional inferiority	43
Epileptic with intellectual inferiority	1
Allied to epilepsy	2
Dementia precox	1
Normal, probably	7
Unclassified	8
	100

At most of the detention stations some effort was made to provide both recreation and occupation for the detained women. As these women were being isolated as a health measure, it was necessary to release them from detention as soon as they ceased to be a menace to the soldiers and sailors, a fact which was determined by finding them free from venereal infection in a communicable form.

The detention of persons suspected of being infected, or known to be infected, is absolutely imperative in peace time, as well as during war. Professor Albert Neisser, of Breslau, discussing "War, Prostitution, and Venereal Diseases," says:

"The greatest possible sanitation of prostitution must be provided for, so far as efforts are unsuccessful by arresting them. I ask myself why this sharp but so useful measure is not relentlessly resorted to. This method of elimination is the most effective, since sanitation, in the case of the most prevalent venereal disease, gonorrhea, is impossible anyway, and because, considering the enormous number of visits of the individual females, not even a daily medical examination would accomplish the purpose, apart from the impossibility of performing a really good examination of prostitutes.

"As regards syphilis, sanitation is much more conceivable. The capacity of all prostitutes for transmitting infection could easily be much lowered if every single one (without bothering about a special diagnosis) were subjected to an energetic salvarsan treatment, or perhaps treatment with salvarsan combined with mercury. If there should actually be one among them still uninfected with syphilis, the treatment would surely do her no harm."

The word "detention" unfortunately carries with it the stigma of a penal institution, just as "venereal diseases" implies to the lay mind diseases of venery or immorality. Effort must be made to inculcate into the minds of the public the fact that, while detention is imperative as a sanitary measure, it should not brand the detained individuals as criminals.

The two years of war have given us volumes of data proving conclusively that the prostitute or sex offender requires individual, correctional care to overcome the handicap of mental inferiority, physical defects, educational neglect, and hereditary and environmental influences.

The detention home has a definite place in the reconstruction programme, but it must be a detention home only in the sense that individuals are detained until such time as they can be returned to society equipped to take their places as respectable and respected citizens.

I do not pretend to be an authority on this important subject, or to lay down dogmatic rules and regulations for establishing and operating these homes; but in general I will say that the ideal location is in the country. This gives opportunity for out-door exercise, and work which is of great rehabilitating value. There must be sufficient space in order that the mentally normal can be separated from the subnormal, and that the girls be separated from the women, because the problem of moral contagion is as great as that of physical contagion.

Competent medical attendance is essential. Adequate hospital facilities for the care of venereal and other infections is imperative.

The atmosphere of the place should be as home like as possible,

the personnel selected from women who are specially qualified and trained, and who have a sympathetic interest and a belief in the movement.

To use a detention home merely for the cure and treatment of venereal diseases is to promote a vicious cycle. Unless the individual detained is given a vocational training whereby a decent economic status can be maintained, the detention home contributes to delinquency rather than corrects it.

The responsibility of the institution in the matter of correctional therapy extends beyond the walls of the detention home. This responsibility is met only when an efficient system of following up cases is established and maintained. William Healy, in his book "The Individual Delinquent," says:

"Comparable is the new social service work done in connection with hospitals—the principle being that if the hospital has given its services as far as the convalescent stage, it is a matter of the greatest economy to carry them still further, and see that the patient is restored to social efficiency. Now the hospital patient's inefficiency is mostly a negative quantity. The ex-prisoner's failure is a positive menace. Society has undertaken to treat him for his misconduct; it desires his moral well being and general welfare. The penal failure, which is everywhere witnessed to by recidivism, can best be prevented by after-care methods that are based on full appreciation of the offender's needs and possibilities. Perfunctory parole work is to be regarded as a weak effort. The same is true of aid to discharged prisoners by whatever agency—successful relief must be based on the understanding of the individual and his relation to his environment."

The war-time detention house was designed primarily to meet an emergency; to protect the fighting men from venereal infections. The peace-time detention house for such an institution must be carried over with the peace-time programme; it must be designed to protect the working forces—posterity—from venereal infections. The peace-time detention home, however, must be designed along different lines. It must provide correction facilities as well as medical facilities. It must be a house of detention, a reformatory, a protectorate, a reconstruction station all in one. It must be part and parcel of the whole state programme supported by legal and executive machinery and by an educated public.

PIONEERING IN VENEREAL DISEASE CONTROL.

BY

A. J. McLAUGHLIN, M. D., F. A. C. S.,

Surgeon (Reserve) U. S. P. H. S.,

Sioux City, Iowa.

(By Invitation)

VENEREAL disease is one of the most formidable evils to which mankind is subject, and one whose history, in all probability could be traced to the earliest records of the human race. Its progress through the generations have left in their wake a blind, maimed, sterile, and sexless multitude. To what an appalling degree women are made victims of these complaints through the men they marry!

Physicians in this special line of work well know the percentage of gynecological operations due to gonorrhea, and the result of syphilis on pregnancy.

We all appreciate that one of the greatest undertakings ever launched in this country, or any other country, for the good of humanity in the way of a public health movement, was the endeavor to formulate a plan to stamp out or control venereal disease. The fight is still being carried on by several different organizations, the principal ones being under Government supervision. The enormity of the task is known better by the men who were connected with one or more of these organizations, and who now fully realize, I am sure, that the end of the rainbow is only a stepping stone toward the final completion of the great task that they have undertaken.

An understanding of what venereal disease means to a community or a country is better realized by men who are handling this special line of work. The rank and file of physicians in their busy everyday walk of life do not give venereal disease close enough attention to be acute observers of the real destruction brought upon humanity by this hidden secret destroyer of human tissues.

Many years ago a noted French physician wrote that of all the diseases which affect the human species there is none more grave or more dangerous than syphilis. It has been a disaster to many good homes, it is a grave danger to public health, filling our asylums with epileptics, imbeciles, and idiots, our prisons with degenerates, and endangering a large percentage of our population.

In the last ten years about thirty thousand papers have been

written on this subject. Physicians and crusaders have been wondering what could be done to avoid the suffering from venereal disease; but very little was accomplished until the recent war, when the War Department and Inter-departmental Social Hygiene Board opened the campaign under the direction of the Surgeons General of the Army, Navy, and Public Health Service, and the Secretary of the War, the Secretary of the Navy, and the Secretary of the Treasury. The above officers took a great interest in this important work, and by their efforts prevented thousands of infections and saved thousands of lives.

During the War a great deal was accomplished in the control of venereal disease. The demand was in evidence and coöperation was given by everyone; but since the armistice was signed, the demand for the crusade against these diseases and the coöperation are lacking to a great extent, making the work doubly hard for those actively engaged in this important measure. We must bear in mind that we are dealing with diseases that are not like small-pox and various other contagious maladies but that one of the most important elements that we have to fight against is the natural tendency toward sexual indulgence, which is overcome with difficulty by the young offender, who, when encouraged to a certain degree, says to himself, "I'll take a chance."

As a matter of great importance to the success of this work, clearly defined, sensible laws should be enacted in all communities so that expense will be covered for detention homes and proper salaries for well trained health officers, and rulings provided so that the carriers of these diseases can be interned until they are free from infection, and be kept under observation by the authorities after they are released. Thus the importance of proper educational methods, such as authentic literature, lectures, films, etc., are the methods to bring about a demand in different communities for the suppression of these diseases, and to overcome to a great extent, or to help fight the desire for improper sex relation. Then proper laws and health officers of ability must be had to enforce the same without persecution.

Another important item in the success of this work is that it should be carried on under Government supervision, a measure which will arouse greater interest, as a great many civilians are of the opinion that if a certain measure is of sufficient importance to interest the Government, it should have careful consideration. Moreover, the people who were in Government employ, or in Government service during the War, knowing that the Federal service is still looking

after the control of venereal disease, will take special interest, and will give more assistance to the work than they would under local laws and city ordinances. If the work is under Government control, better coöperation results in the law enforcement division, and less trouble between City, County, and State officers, as is usually the case in any law enforcement work.

Basing my opinion upon the judgment of a great many genito-urinary surgeons in different parts of the United States, I am inclined to believe that there are more venereal diseases in this country to-day than ever before. In making this statement, I do not feel that I am retracting anything from the good work that has been accomplished by the different organizations that are working on the control of these diseases. Their work has been a great success, but there has been a great increase in the number of infections, especially in the rural districts, on account of the soldiers of fortune that are traveling throughout the country, and the number of women that have been following the cantonments and the different soldiers' headquarters, traveling back and forth from one place to another, spreading infections, and leaving the same conditions as have followed in the wake of earlier wars.

Statistics on venereal disease amount to very little. The only statistics that are not all mere conjecture are those that are compiled in institutions, or in the Army; and the reason that these can be looked upon as authentic is the constant inspection, and the close watching of the men, or the patients, as the case may be. How many hundreds, or, I might say, thousands of cases of venereal disease we all have had that have never been reported, or have never been counted in the percentages published! We know that these diseases are affecting the vital parts of some of the best of our race. An authentic report which will be published in a short time states that gonorrhea and syphilis and their sequel are killing more people to-day in the United States than tuberculosis and pneumonia. If this statement is true, and I have no reason to say that it is not, I think that it is time to roll up the curtain, and to give the laity the plain facts concerning these diseases, just as we would of tuberculosis, cancer, or any other deadly disease.

If we would only stop to think of the number of boys in the American service that were infected within the first thirty days after they were discharged from the Army, and before they reached their homes! After fighting for their country, they were humiliated by having to return home with an infection of venereal disease contracted in their own country, probably in one of our cities, because

the local civilian authorities did not want to embarrass the street-walker or the prostitute by an examination.

I stated that educational methods, such as authentic literature, lectures, etc., are a good means of bringing about a demand in different communities for suppression of these diseases; but the carriers are not reached by this form of control. Law enforcement is the only method through which they can be reached, and if the law enforcement were strict enough, venereal disease could be wiped out. There is a certain class of people who might be called the venders of vice, the people who are making their living by promoting vice, supported by quack physicians and cure-alls, and political power, that are fighting work along this line, because enlightening the ignorant as to the dangers of infection, and the liability of infection drives trade away from the cribs and vice dens.

One of the very important movements that is going to reduce the number of infections of venereal disease is the stopping of the sale of liquor. Many infections are contracted while a person is under the influence of intoxicants.

I would say that about 90 per cent. of infections are due to women, and 10 per cent. to men. Men take more precautions, and are more particular about treatment and prophylaxis. Women are very negligent, and take treatment only for the relief of pain or under compulsion. One woman will infect ten men for every one woman that one man will infect. Prophylaxis should be encouraged. Prophylaxis is not an encouragement for improper sexual intercourse; it is merely a protection against disease; and if venereal disease is on the increase in our country to-day, after all the efforts on the part of various organizations, I think that all rational means should be taken to prevent infections in every possible way.

In the extra-cantonment zones, with Government assistance where law enforcement, quarantine, and prophylaxis were used, public health officers are of the opinion that venereal disease was reduced to a minimum, and the results were very gratifying. Clinics properly managed were a great assistance, and many thousands of cases were treated beyond the infectious stage, a condition which only goes to prove that if these same methods were carried out strenuously in every civilian community, the results would be wonderful.

One of the greatest accomplishments gained by the United States Public Health Service was in suppressing the quacks and abolishing counter prescribing. Very little could be gained in the control of these diseases while sufferers could patronize the quacks, or buy nostrums from the corner druggist. The reporting of these diseases by

all physicians, which is now a law in almost every State, gave the health physicians a line on all cases treated by advertising physicians, and placed the advertiser in a very embarrassing position through the fact that, when a patient came into the advertiser's office, he would not know whether it was a case sent him by the local health officer to catch him for not reporting, or whether it was a case who came there of his own accord for treatment.

The druggist, unwilling to be arrested for practising medicine without a license, was afraid to prescribe, and therefore turned his venereal cases over to the physician near by in the hope that he would receive for his courtesy the filling of prescriptions for the patient.

The prostitutes and streetwalkers, afraid that they would be picked up at any moment for an examination, visited the doctors' offices, so as to be sure that they were not infected, as they dreaded the internment clause in the law enforcement.

The free use of laboratories for physicians and especially for those conducting clinics is of great benefit, and the reduction in the price of salvarsan means a great deal to the sufferers whose finances are limited.

A very important part in the development of this work depends largely upon the sort of coöperation given by the medical profession. If every physician in the United States would take a special personal interest in the control of venereal disease, it would go a long way toward the success of the movement. By encouraging local boards of health in reporting and in the internment of infectious cases, and by enlightening the public in their local communities regarding the havoc which these diseases play in the moral, physical, and economic life would be of great assistance.

An important point in considering the internment of women is that prostitutes are not the only carriers of venereal infections. In some of the large military venereal hospitals of London, statistics show that three-fourths of the infections were due to women who were not prostitutes, but who were common carriers, known in that country as "amateures" and we have found the same condition in this country in different communities. Young girls, from fourteen up, living at home, are the ones that are spreading a large percentage of the infections, and the greatest amount of good is being accomplished among this class of carriers by social workers, women of the Welfare League, police matrons, and probation and juvenile officers. All cases should be treated. A person suffering with a venereal disease should receive immediate attention, just the same as a person injured in an accident.

A properly conducted institution should be provided in every locality for the encouragement and treatment of these unfortunates; and men of knowledge, knowing the danger and the outcome of infections, should preach the gospel to the ignorant and the innocent to avoid these temptations in every way possible.

In summing up the work as carried on by the United States Public Health Service, I may mention first, the establishing of free clinics; second, the educational measures, and third, the internment of infectious cases that were pronounced a menace to public health, and the reporting of all cases in number to State boards of health, so that some accurate idea could be gained with regard to statistics of different States. If all these measures were carried out in every community, the results, I am sure, would be very gratifying.

Education induces the infected person to patronize a physician early in the infection, keeps her away from the druggist and the quack, and also causes the intelligent person to be more careful of becoming infected, and the already infected person to be more careful of infecting others. Then, it is true that sex instincts are modified by education and earlier marriages, and that more legitimate marriages will be a result of proper knowledge of this subject. All results such as these mean less infections of venereal disease. More outdoor recreation, and athletics in institutions, both private and public, have a tendency to do good.

Clinics and free treatment give the poor unfortunate and the middle class an outlet for quick and speedy relief, which in a way lessens the number of infections. Reporting cases provides the authorities with statistics to work upon, and gives the infected person an understanding that the State and Government are taking an interest in this sort of disease, thus causing him to be more cautious.

Law enforcement and internment of persons who are a menace to public health, such as feeble-minded prostitutes, incorrigible girls, and streetwalkers, give the underworld to understand that they are walking on thin ice, that they must at all times be free from venereal disease, and that, if they infect anyone, they will be held responsible. This legal weapon in a measure, prevents a great many infections.

It is my belief that if the United States Public Health Service obtain the proper support and coöperation of the medical profession, and of the laity as well, their work will be far-reaching, and the generations to come will be saved from untold suffering by their efforts.

THE DETENTION AND TREATMENT OF INFECTED WOMEN AS A MEASURE OF CONTROL OF VENEREAL DISEASES IN EXTRA-CANTONMENT ZONES.

BY

W. F. DRAPER, A. B., M. D.,

Past Assistant Surgeon, U. S. Public Health Service, Richmond, Va.

(By Invitation)

WOMEN in the extra-cantonment zones in Virginia who were found conducting themselves in an immoral manner were apprehended by the local police, working in coöperation with the military police and law enforcement officers of the Commission on Training Camp Activities. Upon appearance before the police court magistrate they were immediately ordered to the Public Health Service and Red Cross out-patient clinics for examination to determine whether or not they were infected with venereal disease. Pending the outcome of the examination, they were usually held in the detention home, although the jails were sometimes utilized for this purpose.

Those found to be infected with venereal disease were committed to the detention hospital for treatment until such time as they were considered noninfectious. They were then returned to the police court for trial on the charge for which they were arrested, and invariably released by the judge without further detention.

A most extraordinary feature in connection with the detention of these women was the influence brought to bear to secure their premature release. Prominent and respected city officials, bank officers, doctors, ministers, lawyers, and representatives of almost every walk of life, all were actively concerned at one time or another in obtaining freedom for infected women of the lowest order. Many wearisome hours were expended in convincing these people that neither persuasion nor threats could secure release until the patient was considered noninfectious.

The period of treatment varied from one to five months; the average was about three months. One case remained under treatment eight months. At the hospital at Newport News, cases were treated by the physician in charge on alternate mornings. His treatment consisted of swabbing the urethra with 10 per cent. nitrate of silver,

swabbing the cervix with 5 per cent. nitrate of silver, and inserting a gauze tampon of argyrol or protargol. On the following morning the patient removed the tampon and administered a bichloride douche 1–10,000. In the evening she took a saline douche. The douches were taken under the supervision of a trained nurse in a room especially equipped for the purpose. Another method of treatment consisted of swabbing the vagina and cervix with 10 per cent. nitrate of silver and tamponing with 1 per cent. picric acid.

In cases of gonorrhea, four successive negative slides taken one week apart were required for release. Douches were not permitted on the day preceding the taking of slides. Cases of syphilis were released as noninfectious when there were no visible lesions of the skin or mucous membranes, and after several injections of salvarsan combined with mercurial treatment.

During the period from December, 1917, to December, 1918, there was a total of 208 patients treated in the detention hospital at Newport News. All of these cases were infected with gonorrhea, and forty of them had syphilis besides. No cases of syphilis alone were treated at the hospital.

Of the 208 patients, 160 were colored and forty-eight were white, and it is interesting to note that of the 160 colored patients only eight came from out of town, while of the forty-eight whites, forty-six were from out of town.

The patients ranged in ages from eighteen years to forty-two years; the average was but slightly over twenty years. The vast majority of the whites were of an extremely low grade of intelligence.

In the opinion of the writer the detention hospitals were a potent factor in controlling the spread of venereal diseases in extra-cantonment zones in the following manner:

1. By making it possible to remove a large number of infected immoral women from the community and to hold them absolutely apart from the general population for a number of months.

2. By making the chances of isolation for a considerable period of time so great as to discourage immoral women from operating in these areas.

3. By giving a practical demonstration to the community of the high prevalence of venereal diseases among immoral women, and the time and effort necessary in the treatment of these diseases.

4. By actually removing foci of infection by medical treatment.

The actual treatment of the women is believed to have been of far less importance in controlling venereal diseases in the extra-cantonment zones than the other factors mentioned. None of the women

gave the slightest indication of any intention of changing their mode of life. It was what they were accustomed to, what they liked, and what they intended to follow. In this connection the efforts of doctors, nurses, and social workers proved of no avail. One of the most promising and intelligent of the women was encouraged to learn something of practical nursing during the months that she spent at the hospital. She became very proficient in the preparation of patients and in simple nursing duties, and apparently was much interested. Upon her discharge from the hospital, a position was secured for her as assistant in the operating room of one of the local physicians at a salary sufficient to enable her to maintain herself in respectable surroundings. After remaining a few weeks she disappeared, and when next heard of was plying her old trade on the Washington and Norfolk boats, and was much more prosperous than before because of the refinements she had acquired during her association with respectable people.

The only patient who showed any appreciation whatsoever of the treatment received was a colored woman who was suffering acutely from her disease.

For the most part the women believed that they were the victims of circumstance in being brought to the hospital. They revealed not the slightest interest in the diseases with which they were infected, and no amount of information or persuasion could change their attitude. They took their treatments willingly because their release was gained thereby, but seldom overlooked an opportunity to escape during the period of treatment. They gave free expression to their ideas of the injustice to which they were being subjected because others whom they believed far more deserving of isolation remained unapprehended. They were loud in their assertions that they would give Newport News a wide berth in the future, and that they would warn their associates of the horrors which they had experienced.

All but two of the white women are believed to have left Newport News immediately and permanently after their discharge from the hospital. The two white women who remained in town, together with twenty-three colored women, were again apprehended and admitted to the hospital a second time with new infections.

In the adaptation of the control of venereal diseases from a war-time to a peace-time basis, it is believed that the detention hospital for women is an absolute essential, and that upon its development and maintenance will be found to rest the ultimate solution of the venereal disease problem. By no other means can infected immoral

women be prevented from spreading disease while under treatment, and by no other means can gonorrheal patients at least be rendered actually noninfectious.

A period of treatment lasting only a few months is of doubtful efficacy, and serves only to embitter the patient without in any way detracting from her intention of again resorting to prostitution immediately upon her release from the hospital. It is believed that the period of detention and treatment should be extended for a period lasting from one to four years, thus allowing time for more definite results as to treatment and affording an opportunity for rehabilitation. In cases where the mentality is so low as to preclude the possibility of a life other than one of prostitution, it would be an economy and a humanitarian act to commit such individuals to institutional care for life. They are a far greater menace to the happiness and welfare of society than many murderers who are serving life sentences in our prisons.

Venereal diseases can never be controlled by isolating the carrier for a fleeting interval, then turning her loose to become a carrier again, and continuing the vicious circle *ad infinitum*. The detention hospital then will probably become a farm where a large proportion of the inmates will be able to indulge in a healthful occupation and render the institution at least partially self-supporting.

The cost of the detention hospital is the most serious obstacle in the path of its development. Few communities are willing, if indeed they are able, to maintain such an institution. It is freely admitted, therefore, that Federal aid in the establishment and maintenance of detention hospitals for women will be necessary for a considerable time to come. Detention hospitals not adequately equipped and provided with proper facilities to accomplish the work at hand are worse than none. Jails when used for hospital purposes are an abomination, and serve only further to degrade and debase the poor unfortunates who come within their confines.

DISCUSSION.

(Papers of Drs. Findley, Pierce, McLaughlin, and Draper.)

Dr. W. F. King, Acting Assistant Surgeon, U. S. P. H. S., Indianapolis, Indiana (by invitation).

The most complete experience in the control of venereal diseases has been that of the Army and Navy under military discipline under war time conditions. I have had the task for more than a year of attempting to direct the fight for control of venereal diseases

under peace time conditions and I am not discouraged. I believe the plan now being carried on in most of the States of the Union offers more toward the solution of the venereal disease problem and toward the elimination of venereal diseases than any other plan yet proposed or undertaken.

There are just a few points brought out in the papers read that I wish to touch upon in the few minutes allotted. In the first place it is my firm belief that the most essential element in the control of venereal diseases from a peace time standpoint is that the medical profession should realize its responsibility in this work. For fifteen months, it has been the rule of the State Board of Health of Indiana, which rule under the laws of the State has the same force as law, that venereal diseases shall be reported by physicians. As a matter of fact, most cases are not reported. In the first fifteen months in which this rule has been in effect, less than 3000 cases have been reported for the entire State and fully 75 per cent. of these cases have been reported from the free venereal disease clinics operated in the State. The physician must realize that he becomes first aid in venereal disease control and should become in fact the personal health officer to every patient under his care.

In the second place I wish to emphasize what was brought out particularly in the paper of Dr. Draper, namely, that the Detention Hospital or Detention Home is absolutely essential and absolutely indispensable in any successful plan for the control of venereal diseases. It is a surprising thing that comparatively few hospitals in the United States, even those supported by public taxes, are open to acute cases of venereal disease, while the doors of every hospital are wide open to the end results of these diseases. It seems to me we must come to the logical conclusion that any hospital supported either in whole or in part by public funds cannot be permitted to close its doors against the treatment of acute cases of venereal diseases.

In connection with the clinics in the city of Indianapolis we have two wards in the City Hospital with the patients divided as to sex and color. It required five months, however, to secure the full coöperation of the City Hospital authorities in the treatment of cases in these wards. At the present time every patient admitted to the City Hospital with a venereal infection, whether this infection be associated with tuberculosis, cancer, maternity, etc., is sent over to the venereal disease wards and we have full and complete coöperation in the treatment of all cases. A Social Service worker is in charge of these wards and I have here a report of a study of cases admitted from January 1 to September 1, 1919. The report shows that a total of 77 women patients have been admitted to the venereal disease wards, 22 of whom came voluntarily, 55 being brought in unvoluntarily from a city court, criminal court and through our investigators. Just a few facts stand out prominently in this report. The large majority of these women, both white and colored, are engaged in house work and a very large percentage never completed the elementary grades in school work. It is shown also

that at least 20 per cent. of the patients in these wards, and this applies to both men and women, are definitely feeble-minded. To treat these cases and turn them loose not only to become reinfected, but to perpetuate their kind is to establish a vicious circle and, of course, to accomplish no good results.

I have not time to take up the details of this report, but the facts as shown in the report prove that society is largely responsible for these conditions, and that our educational processes and Government processes are at fault and tend to perpetuate the very conditions against which this campaign is organized. In the final analysis, in addition to hospital care and detention for acute cases of venereal disease, the State must provide a place where feeble-minded men and women prostitutes can be segregated at least past the procreative period of life and be made to return something to the State for their care.

Dr. Albert Goldspohn, Chicago.—I feel the gentlemen who have so nobly given their time to fight these destructive diseases that become so horribly destructive under the exigencies of military mobilization deserve very great credit.

I simply wish to make a few remarks with regard to the technic and indication for applying medicaments to the cervical canal, the ur thra and the endometrium, in non-pregnant women where the cervical canal is not widely dilated as in puerperal conditions or after advanced abortion, where you can introduce any kind of swab and deliver the active agent within the uterine cavity to the fundus. This cannot be done in the ordinary uterus where the cervical canal is not thus widely dilated. It will have to be dilated with very great difficulty in the ordinary case, and the processes of dilatation that would be needed in order to apply medicaments on a swab to the endometrium, would be contraindicated in a cervical canal that is infected with gonorrhea. Before we can begin to treat these disorders, we want first to understand how nature's own processes act in dealing with that infection. We know that the majority of cases of gonorrhea, especially in women, pass off comparatively easy and without serious injury because of the very effective barrier that nature interposes to the infection in the form of a viscid, tough, cervical exudate or mucus which it throws out in response to the invasion of the enemy. It is peculiar to the cervical canal only and never comes from the endometrium. The discharge from the latter is of a milky or creamy character, and never viscid. It arrests the gonococcus long enough to make it loose its virulence or vitality in the majority of cases. The very fact, as stated by Dr. Findley from his large experience, that only 2 per cent. of all those infected had any serious disease of the appendages, shows the efficiency of nature in shutting out gonorrhea from endometritis and salpingitis. If nature is so effective that it will do it in 98 per cent. of the cases, it behooves us, to respect it and not interfere with nature's processes. Our medication in acute gonorrhea should stop at the external os. There will come a time when this plug of mucus and these deeply hypertrophied and inflamed cervical glands

will have to be dealt with without danger of infecting the endometrium and the tubes.

Dr. J. Henry Carstens, Detroit, Michigan.—The subject under discussion is a very large problem and I do not know how we will ever solve it. The papers by Dr. White and others have shown that women and girls after treatment go back, resume a life of prostitution, and become reinfected. They keep right on infecting somebody else. They are treated again, are cured, and return to a life of prostitution. These girls being feeble-minded you cannot do anything with them. If we did relieve these feeble-minded ones, we would get the next grade to deal with who are a little better than they are, but still may be feeble-minded. They take their places, and so it goes on and on.

I have often thought if we could not do something to prevent infection as in the Army by using a prophylactic salve which certainly has remarkable results in preventing infection in men. If we could use such a thing with women it might do a good deal of good. Necessarily, if very few women are infected, naturally very few men would become infected. There is only one thing to do as I see it, and that is to minimize these diseases, that is, prevent their occurrence by prophylactic measures such as were employed in the Navy and Army.

Dr. Francis Reder, St. Louis, Missouri.—My experience in reference to venereal diseases in the last ten years has been confined principally to its gynecological aspects. The cunning of these women, so far as my experience goes, is such that it requires careful observation to detect the manner in which they ply their trade. Many of them masquerade as manicurists, milliners and dressmakers. The difficulty in tracing such infected women resides in the clever manner in which they can deport themselves, especially when the laws of a city are somewhat lax and ill enforced. As one of the speakers has remarked, it rests to a certain extent with the doctor who is usually in a position to be able to trace and locate suspects, for it is the doctor who is treating these women and it is the doctor who can obtain their confidence if any one can. The inadequate laws of the municipality or rather their lax enforcement makes it difficult to act authoritatively. If these women could be placed under proper surveillance, or under arrest, if necessary, so that care, cleanliness and treatment could be fittingly carried out for the length of time necessary to effect a cure, much of the spread of this infection could be obviated.

In a detention home the difficulty arises in retaining infected women sufficiently long so that they can be pronounced cured. In our City Hospital we have not the authority to retain a patient if she wishes to be discharged. This handicaps the work very much.

Dr. Goldspohn in referring to preserving the natural barriers against such a disease is absolutely correct. When such natural barriers have been disturbed, it becomes imperative on part of the physician to see that this treatment will supplant these natural barriers in the best possible way.

Commander William Seaman Bainbridge, New York City.—The enormity of this whole problem has been emphasized during my active service of over two and a half years in the Navy, much of the time abroad, to a more appalling degree than at any time in my professional life.

The other day, one of the most distinguished members of the Public Health Service said to me, in response to the question, "what do you consider to be the greatest asset which has come to America through the war?", the "placing in every small community as well as throughout the large communities, those who can be appealed to and will back up public and private hygiene." In other words, we need missionaries of health who believe that it pays to be healthful individually and collectively, and that certain things can be done in communities throughout the country now, as never before, provided the medical profession and the Public Health Service of the country will march hand in hand and coöperate thoroughly at this strategic time, with those in each city, town and village, who know that it pays to observe the essential laws of health.

This being true, the great facts of interest in health matters and propaganda along the lines in your papers, are certainly most timely. However, is there not another side which deserves our most serious thought? It has been affirmed that the two greatest factors in the prevention of immorality, is the fear of venereal disease on the one hand, and the danger of pregnancy on the other.

While progress is made in diminishing of venereal disease, is there not a possible danger of increasing general immorality? What has concerned some of us is the present method in Army and Navy of treating syphilis. Are we putting the external evidence beneath the surface only to have it crop out in the next generation? After the war, are we to have more hereditary syphilis to take the place of the primary and secondary type which has so often followed wars of other days?

There has been expressed often skepticism about the Wassermann test. May I ask for information on the following questions:

1. Of what value is the Wassermann test unaccompanied by any clinical signs or symptoms?

2. Are we any nearer a standardization of methods of detecting and treating syphilis than before the war?

3. We have mentioned the curability of syphilis. Of what does a true cure consist?

Dr. James E. Davis, Detroit, Michigan.—Leadership in this work very properly belongs to the United States Public Health Service and in the states to the several local health organizations. To my mind the only efficient way of treating this disease is by internment. When a case is interned it can be properly studied and properly treated, and as has been mentioned, moral teaching so necessary for these cases can be carried out. I think very much better work can be done in regard to the moral treatment. A course of instruction can be given to these girls which will help very materially,

with lantern slide illustrations of the gonococci and their effects upon tissues, the spirochete and its effects upon tissue, and an earnest talk with the showing of these slides in Michigan, we have found does a great deal toward securing the coöperation of the patients and toward securing a lasting impression upon them, so that when they go out a certain percentage, at least, are willing to restrain themselves and go where they can have some moral, uplifting environment.

Just a word or two in regard to the treatment. First of all, I differ from Dr. Findley in the percentage involvement of the appendages in these cases. I cannot understand how only 2 per cent. of the appendages are involved. In the series of cases that we studied there were over one-third with their appendages involved.

Again, I believe it is very bad treatment to open the internal os. Here is one of the protecting forces. The sphincter—and we may call it a sphincter—might prevent the infection of the endometrium beyond the cervix in many of these cases and the cervicitis may exist for a long time before you have infection extending beyond the internal os. Therefore, you may in well treated cases prevent some of the end results if you do not enter the canal beyond the internal os.

Another word in regard to moral treatment. If there is any value in religion as a moral uplift, it should be applied to these cases. I think well directed judicious effort is of immense value in reforming these girls.

Dr. John W. Keefe, Providence, Rhode Island.—This problem is so vast that I have great admiration for the men who have been seriously attempting to improve the condition. It would seem to me that we must despair before being able to help in any way.

I have come in contact with some of this work from being a member of a commission that looks after our state prisons, insane hospitals and home for feeble-minded. The fact that such a large percentage of immoral people are feeble-minded is a reason, that at once, will prevent us from educating or improving to any degree, unless we isolate the feeble-minded in the various states, and thus far very little has been done in this country to remedy that defect. Dr. Fernald has been a pioneer in this work, and in Massachusetts he has developed some of the best evidences, that many defectives can be segregated and in that way prevented from reproducing their kind, and also that these people may be made partially self-supporting rather than a drain on the community.

When we speak of passing laws to report venereal diseases, the community feels they have done a wonderful thing, and yet it has been shown here, what a small percentage of the doctors report the cases, even though the laws require it.

A great source in this country of the spread of venereal disease to my mind is not through the prostitute alone. It is true, the prostitute is accused of spreading venereal disease; but the rich man's son is the one who spreads disease, the man who is protected by the money of his father.

I was very glad to hear the remarks of Dr. Davis, because at our meeting a year ago at Pittsburgh, not a single man in discussing this problem said a word about the moral and religious side of it. The great Napoleon at one time concluded that France could get along without religion, but before he died he stated that it was absolutely necessary for France to have some religion. In our own country many of our college professors seem to take great pride in showing a diversity of opinion in regard to religious matters, or belief, and yet today, it holds just as good as it did in the days of the Romans, or the French Monarchy. Unless a boy has some strong, moral religious home training, to keep him straight, he will not remain straight.

Dr. Ross McPherson, New York City.—I wish to refer to only one or two points. In the first place, I want to agree with Dr. Goldspohn, for if I understood Dr. Findley rightly, that he dilates the cervix in cases of acute gonorrhea, I shall have to disagree with Dr. Findley very strongly. I think dilatation of the uterine canal in an acute case of gonorrhea is very poor practice and I should not care to attempt it. I also feel that a great many of the adnexal cases which I see are directly the result of the treatment that the doctor gives and not the gonorrhea. The practitioner who takes an acute case of gonorrhea and begins to stir things up in the uterus and spreads the infection about, is much more likely to bring on tubal disease and endometritis than the woman is to produce it of her own accord if she is let alone. I do not think we should go on record as agreeing with Dr. Findley if he means the acute cases. In the subacute and chronic cases such treatment may be more beneficial.

I think the genito-urinary specialists in treating male patients with gonorrhea at the present time have very largely come to the point where they believe in letting these patients alone, putting them to bed, giving them a certain amount of medication and letting them rest until the acute attack subsides.

Dr. H. Wellington Yates, Detroit, Michigan.—I am exceedingly interested in this subject, for with Dr. Davis I have charge of a hospital in which about fifty cases are segregated for this purpose. It has been, at times, very discouraging, yet very interesting at all times, considering the work we have been able to do for these girls, and a part of the good that we have been able to get out of this hospital and out of this particular clinic in the hospital is that we have been able to give them service and at the same time help to educate the medical students which is so valuable and yet so difficult to do in this branch of medicine.

It is a difficult thing to segregate patients of any kind in sufficient numbers so that they may be a teaching asset, but this institution gives us a splendid opportunity.

I want to support what Dr. Davis and Dr. Keefe have said, about the possible good that may come from moral teaching to these patients who are 85 to 90 per cent. below par mentally. They are receptive of good or bad influences as all patients of the child-like types are, and the hospital to which I refer in Detroit is under the auspices of the Salvation Army. I suspect that many of

you who have not been associated with such a hospital and with such work may not realize the good that comes from it. Shouting hallelujah on the streets and the swinging of tambourines, is what many persons think as the chief asset of the Salvation Army. If there are those who think the Salvation Army does very little good among this class of people, I want to get that thought out of their minds.

There is what some of the Churches call a working religion, that is, a moral sentiment which goes along with the hospital environment toward the education of these girls, which has indeed a very indirect bearing upon what we see and hear of hallelujahs and tambourines, although the latter may, however, have some good in it to this end, since as we have said, we are dealing with the child mind in at least 85 per cent. of these individuals. We are strongly of the opinion that this religious teaching has been a wholesome influence at least upon the conduct of these girls while in the hospital.

So far as we are concerned, we do find that some of these patients, a considerable number of them, are definitely influenced for good, and I believe permanently. A great percentage of them are influenced for the better, and even while they are in the hospital they are more receptive to treatment. They are more willing to stay there. Of course, we have our ups and downs about their leaving the hospital. We find some mornings that four or six or more may have disappeared. We have had two jump out of windows, one broke her back, and recently one of them got out at night, and the next day she held up a man in our town, shot him, and took away his money.

With reference to the question of treatment, I want to substantiate what Dr. McPherson has said. I am strongly inclined to believe that we should leave the acute cases of gonorrhea very quiet, and we should only give these patients such treatment as is palliative and cleanly.

I want to speak of another thing which has not been mentioned, that is, in relation to the treatment of Bartholin's glands and ducts. There has been a common sentiment expressed this morning that the cervix is the last to be involved. This may often be true but in our experience we have learned that Bartholin's glands hold this infection longer than anywhere else. We have frequently found that clinical evidence of disease was wanting in all the other areas of common infection, together with the fact that five negative smears had been made, yet we could find unmistakable evidence of chronic disease still obtaining in Bartholin's glands, the duct meatii of which are sealed and the enlarged glands give clear evidence of infection.

On opening these glands they show evidence of a subacute process, thus making it necessary that in such instances as we have these large glands to deal with they should have such treatment as local application may indicate together with massage or perhaps their removal in entirety.

Dr. John D. Miller, Cincinnati, Ohio.—The subject is to a great degree a sociological question. How are these girls going to make their living? They are under par and the state or the city puts

them out, and they are not able to earn enough to keep them sufficiently clothed, and they go back to the same occupation. It seems to me to be an endless chain.

Recently they took away from the Gynecological Service of the City Hospital the best ward we had there and have now converted it into a ward for the treatment of venereal diseases. We have a ward for women which will accommodate fifty-three or fifty-four patients. That ward is constantly filled. Some of the women have come back three times for treatment since the ward has been opened, so that it is certainly a very difficult proposition to know exactly how to handle these cases. The acute cases we treat usually symptomatically. We do not apply any specific treatment to the cervix or to the uterus. We treat these cases very much after the plan Dr. Goldsphon mentioned, that is, the cervix has a plug of mucus which protects the inside of the uterus, and we leave the cervix severely alone.

The great majority of cases that come back are not reinfections as shown by tests. They are what we might term cases of reawakening. The tests we make are either positive or negative, and three negative tests will allow a girl to go out. Shortly after some of them leave there is a relighting up of their condition and they are returned for another course of treatment. In the chronic cases we dilate the uterus and thoroughly curet, and if the tubes are diseased we do not hesitate to do a laparotomy.

Dr. George F. Chandler, Kingston, New York.—During the last few years I have had an unusual opportunity to study the venereal disease problem. I organized the state police of New York State and we have had a lot of work to do with the military authorities and with the local authorities in this matter.

As a moral question I agree with Dr. Carstens, that you cannot do anything with it. After considerable study I discovered that in the rural districts around the small cities, there were what we call road houses in which were a lot of prostitutes. They make these places their homes and they also use country boarding houses. They tie themselves up with the taxicab drivers in the city and after some study I was appalled at the situation that obtained in these rural districts. I do not think those who practice in cities know anything about it. The State Police investigated these places. We found that men motoring through the state would stop at these road houses. We obtained our information from good citizens and we would then have a man in uniform call at these houses and talk to the proprietors asking what kind of houses they were running. They sometimes got angry about it but we did not care. The fact that the State Police were watching certain places spread like wildfire around the country and all patronage promptly ceased. We kept up the agitation to such good effect that Major Wright of the Department of Justice stated in his last report that New York State is about as clean, if not the cleanest state in the Union. We certainly have done a lot of good work in that way. We drove women into the cities, that is true, but if you can have the local authorities back you up, you can

drive them out of the cities and into the rural districts again, thus diminishing their opportunity, and we will lessen venereal disease in this way. I believe that a State Police force that is not politically appointed, that will go right straight into the rural districts, can be one of the most effective means of lessening, if not doing away with venereal diseases. I look upon it as purely a police problem.

Dr. Hugo O. Pantzer, Indianapolis, Indiana.—With syphilis and tuberculosis we have lately attained a fuller concept of the great and ulterior effects of bacteremic diseases; but as yet, how little is developed the clinical appreciation of the parallel effects prevailing by other bacteremic infections! We have for a long time observed that such diseases as typhoid fever, scarlatina, etc., leave a notable per cent. of their victims permanently weakened, but how hazy has been our concept of wherein lies this weakness and how inadequate our remedies to combat it! And moreover, how little as yet is unfolded to us of the formidable menace latent in these weakened individuals as "carriers" of specific disease germs!

Another thought I wish to express is in continuity with the remarks made by Dr. Keefe. If we could take from the spirit and practice of our religion and law their vindictiveness, if we might accept for our guidance the words of the crucified Christ, "O Father, forgive them for they know not what they do," we would then logically abhor and abolish all thoughts of penalty and penal institutions. We would instead have created "courts of sympathy" and "homes of benevolence" for these unfortunates, who must be restricted in their liberties because of their inherent evil tendencies. This spirit and such measures would make for the betterment of mankind and then even more for the betterment of those outside than those within these institutions.

Dr. John Norval Bell, Detroit, Michigan.—There is one suggestion I would like to make. If the Marine Hospital Service would publish a circular of some kind, with illustrations of a huge ulcer of the penis or vulva, and a brief statement to the effect that if you neglect scientific treatment, this is the condition that may result, it would accomplish much. There is nothing so convincing as a good picture. This circular could be printed, distributed to the men who are in charge of the Public Health Service in each community and it should be their duty to see that every doctor in that community is supplied with a certain number, so that, being the men who originally see and treat these patients, can give them the little circular, they can read it, and it will help to educate future patients.

Dr. Miles F. Porter, Fort Wayne, Indiana.—It seems to me that the most important aspect of this question, is that which pertains not to the individual case but to the public, and that point which has impressed itself most forcibly upon my mind is this: we have a machine in our detention hospitals, etc., which works first rate under central authority but fails when the central authority quits functioning, all of which means that if we are ever to get anywhere along the line of public health development, we have got to make

up our minds that it must be a machine the head of which is in Washington, a federal institution, and it appears to me now would be a good time to place this Association on record as being in favor of a federal health administration. Then we can begin to do some good. We won't have to wait for another war before we can successfully run our detention camps for the treatment of venereal diseases.

Dr. Douglas C. Moriarta, Saratoga Springs, New York.—I would like to ask how efficient the treatment is and whether curetment was done in the chronic cases.

It seems to me, the mere fact that these smears were made and these women were allowed to come back, is not enough. What constitutes efficiency treatment? I would like to be told.

Dr. Palmer Findley, Omaha, Nebraska (closing on his part).—With reference to the remarks made by Dr. Carstens, I do not share in his rather gloomy outlook of the problem. When I first went into the work, for the first month I was discouraged because we did not seem to be getting anywhere. As the days went by my confidence was more and more inspired and near the end of the service I must say with some fear of being regarded as overenthusiastic, that I had the utmost confidence in the cleaning up of these cases, provided the infection was confined to the uterus and urethra. Not only did I believe we could clean them up, but I would almost schedule the time when we would get results. We had these women under conditions that we do not have in private practice.

In regard to the acute cases of gonorrhea, Dr. McPherson misunderstood me in reference to the management of such cases. I am just as much aware as any of you that in an acute inflammation, rest, time and cleanliness are all there is to it, and I do not for one moment recommend injections or swabs or anything else in such cases. However, we had very few cases, not more than half a dozen of the whole three hundred or more. These cases were put to bed, given douches and large quantities of drinking water to wash out the urethra. We did not give vigorous treatment to the sub-acute cases. Most of our cases were chronic and long standing.

We have heard Dr. Goldspohn and one other gentleman who discussed the paper say something about the internal os as a barrier to the onward spread of infection. If we go back to our anatomy we find, after all, that there is no real anatomical barrier at the internal os. You remember the cervix is lined with a cylindrical type of columnar epithelium, with an elongated nucleus at the base of the cell. We have glands in the cervix with the same type of epithelium. These glands branch widely and we have in the body of the uterus tubular glands secreting a thin mucus. The individual epithelial cells are low and broad and have a round nucleus in their center. At the internal os we have a shading off of these anatomical conditions. Hence there is no anatomical barrier against the upward spread of infection at the internal os.

I do not know what produced the results, but after we resorted to the gas machine and dilated the cervix and swabbed out the uterus with formalin and iodin, these cases that had resisted treatment for

weeks and even two or three months responded like magic to treatment. Whether the gonococcus was confined to the cervix or the body of the uterus I do not know, but I know that I got results.

As to the moral uplift work, I took this up at the beginning with a great deal of enthusiasm. I asked the Y. W. C. A. to appoint an experienced worker for the home. We have a splendid woman experienced in welfare work to look after our inmates, and while I would not for one moment detract from such work, I believe from my own experience it was discouraging in every single instance. The girls as a rule were as responsive as could be while they were in the hospital or home, but when they got out they returned to their old ways. We did follow-up work; we had religious exercises; we had health talks. Dr. McLaughlin gave a splendid talk one afternoon. We had daily family prayers lead by the matron, and, while the girls were not compelled to attend them, most of them did. I think our most interesting case in point was that of a trained nurse. She was bright, she was not only a trained nurse but a correspondent for one of the papers or had been. She made a number of public addresses in churches and elsewhere on the work of the Detention Home to combat the propaganda carried on against it. We had great hopes for that girl, but when she left the home she was not content with living with one colored man but lived with two.

You must remember that most of these girls have a low grade of mentality and there is not much material to work on.

Dr. H. F. White, Washington, D. C. (closing on his part.)—I have listened very attentively to the discussions and have been very much interested in them. The one thing that impresses me more than anything else has been the pessimism displayed.

I have been in the fight from the beginning until the present time. I started a part of it in southern cities and in one southern city I fought very hard. I saw defeat there at one time but managed to bring success instead.

I am going to confine my remarks to the value of detention homes in the control of venereal disease. We must have a place to put these infectious cases. The state should provide an institution for the feeble-minded. Every women arrested on charges involving immorality, disorderly conduct, etc., should first be given a physical examination; second, but most important, a mental examination; and if it is found that she is feeble-minded she should be sent to that institution. It is obvious she cannot measure up to the standards of society. The degree of her mentality is such that she should either be permanently segregated or segregated until such time that she can take her place in society decently. That should apply not only to women but to men. In that way, and only in that way will we ever be able to break the vicious circle that is existing to-day.

Relative to the syphilitic, we can only determine a syphilitic by the serological test and the clinical history of the case. I believe we have to depend on them. I can say positively that advanced work is being done now on the Wassermann and new serological tests are being made or are being developed. Verne, in France, is

working diligently on it and he believes that he will not only be able to say that a person is syphilitic, but can state the degree of the infection. He claims that if he can get a negative Wassermann of the blood and of the spinal fluid, and it will remain negative eight months after repeated examinations, that patient is well; and if in three or four years, should a patient return and the serological test prove to be positive, he would be rather doubtful relative to the return of the original case and would be inclined to believe that it was a reinfection.

Relative to hereditary syphilis, we feel optimistic as to the results. We believe that treatment, a vigorous educational and a law enforcement campaign, with detention and psychological studies, will cut down the amount of hereditary syphilis.

From a national viewpoint, and judging from the program we have inaugurated and are trying to develop through the State Boards of Health, we feel satisfied that legislation is a good background. It is at least comfortable to know that you will have the necessary legislation on which you can depend in case of necessity.

Next to the legislative program, which includes the reporting of diseases and the elimination of prostitution, we consider medical centers of next importance; centers through which the social worker can accomplish a great deal, and a general educational campaign through pamphlets, posters, and lectures can be distributed. Next to that we consider our educational campaign. Although possibly limited, we think it has done some good and we hope in the future to get our literature on higher planes; to get away from the war time psychology and get it down to a peace time way of thinking, and give you more suitable and concrete data, and that the educational campaign in the future will be of more benefit than it has been in the past.

We hope to develop other phases but I believe the way we are working with the organization now that spreads to forty-eight states, this campaign against venereal diseases will be a success. We are big enough to believe that we are only beginning something that will eventually be a success. The more we get into it the more momentum we gather, regardless of who shall help us and who shall drop out, the more successful such a campaign will become.

Dr. A. J. McLaughlin (closing on his part).—As Dr. White has stated, we who are working in venereal disease control look forward to universal success, to universal good, and not a community affair. We certainly would have been discouraged long ago if we were looking to any special community for success. We feel that our success is gradually gathering considerable momentum, and we are doing some good all the time and are growing. That is the idea of the Public Health Service and of the men who are working in venereal disease control.

Dr. Keefe spoke about failure in reporting the case of the rich lady. If I was a lawyer, a criminal lawyer, and a man came into my office and turned his case over to me for murder, and he said to me as a lawyer that he had committed this murder, and asked me to defend him, I would not call up the authorities and tell them that

he had confessed to me. I do not think lawyers do that, and the Public Health Service do not expect doctors to report cases where it is going to expose the patients at all even by number. However, I cannot see any reason for not reporting the case of the rich lady by number and name if she is spreading infection just as we would report the case of the poor woman.

We all appreciate the fact that religion and moral training, as a matter of fact, with the oncoming generation will have a great effect upon venereal diseases and it is having a great effect at this time. But did you ever stop to think that the high school boy with venereal disease who consults a doctor which goes on to an epididymitis or orchitis will say to the doctor, "If I had known what this infection meant, I would not be here to-day, and I will never be here again." That is where education is doing good. I talked for about six or eight months to draft men on this subject and conversed with many of them afterward and know that education does a lot of good.

One of the speakers referred to ringing up the curtain. You will never accomplish anything in venereal disease control until you ring up the curtain and keep it up. You have got to educate civilians and the public before you can do any good with venereal disease. How many young growing up people in this country today know anything about the after-effects of syphilis? I wonder if they know anything about the deaths; I wonder if they know anything about locomotor ataxia, and that sort of thing. That is the reason you have so much locomotor ataxia and latent syphilis because patients do not receive sufficient treatment and are uneducated. Recurrences take place because of insufficient treatment.

Did you ever stop to think that a woman who comes back to the office of the gynecologist complaining of a recurrence of gonorrhea is having sexual intercourse with the same man who infected her in the first place, and is reinfecting her? You can take 50 per cent. of the recurrences and you will find they are reinfected primarily and secondarily through the same sources. If you call in the husband and use the three glass test on him you will find that he infected his wife, and is reinfecting her.

Dr. W. F. Draper, Washington, D. C. (closing the discussion).—Dr. White and Dr. McLaughlin have very thoroughly covered my views on the subject, Dr. White especially.

I have been very much interested to hear the question of the moral and religious effect in connection with the treatment of venereal diseases raised. I rather hesitated to say anything very much about that in my paper, because I have not been accustomed to to hear doctors talk very much about moral and religious affairs. However, I do believe that the moral and religious side of this question is an extremely important one, and that its ultimate solution will not be reached until we apply to the very fullest the moral and religious side. We all know that what a person really believes honestly and particularly believes within himself is the most powerful influence he can have. You may know that in cases of psychanalysis we take people with neurasthenia, with obsessions and curious mental conditions and find out what these beliefs are

due to. Then we really supplant in their minds something else to take its place, and usually what we will put there is philosophy contained in the Bible, or the practical application of the principles in the Bible. People who have sufficient mentality to grasp any phase of religion, if they can be used to supplant their wrong doing, it will have a decided effect.

Prostitutes can perhaps be divided into two classes, those who are really feeble-minded and below par, and so far as they are concerned you cannot do anything with them except to direct, isolate and segregate them, and those who can learn something else and can be removed from the past which they had trodden before. I do not see any sense in taking a feeble-minded individual and curing her and turning her back into the community again when we know well that individual is not capable of doing anything different from what she did before. In fact, I know we can never control venereal disease as long as we do that, and I think very likely the reason why venereal disease has not been controlled and nearly eliminated is because we have not done that.

Psychological tests are one of the keynotes to be considered. We must put the mentally inferior person who cannot be educated and rehabilitated into some kind of institution and keep him there for life, otherwise we will have venereal disease spread and continue to do so. This will entail a tremendous cost on the community and be a terrible drain, and so on, but it is simply a question of whether it is better to have venereal disease than to spend money and do away with a good deal of venereal disease.

As I stated in my paper, patients ought to be kept in detention from one to four years. I say that as a result of experience. The patients whom we had in our hospital from one to five months went out absolutely embittered. They did not care about the fact that they had disease and had no intention of doing anything else. The doctors talked to them. I talked to them, but what we said had absolutely no effect upon them and one might as well talk to the wind. It did not have any effect, and one of our nurses, a most estimable one, a woman of force and influence, talked to them but what she said had no effect at all. Our social workers had no effect or influence with this class of people, not as much as the rest of us from my own observation. So these women went out absolutely bitter and protested against the whole thing. If we can keep them there long enough and do the right kind of thing for this particular class of people, so that we can accomplish something, great good will be done. Because I talk to a patient and cannot accomplish anything, it does not mean that the Salvation Army cannot do it. The Salvation Army does not appeal to me in its methods of teaching, but it does appeal to another class of society, and it can do what no one else or nothing else can. The Salvation Army and other influences of that kind very likely can teach good to these people and get a response which nothing else can do, and it is worth while keeping these people long enough to try these things out thoroughly so that we will know what we are doing.

SYMPOSIUM

ON

THE ADMINISTRATION OF ANESTHESIA IN OBSTETRICS, GYNECOLOGY, AND ABDOMINAL SURGERY.

SAFETY FACTORS IN THE TEAM WORK OF OPERATOR AND ANESTHETIST.

BY

JOHN J. BUETTNER, M. D.,

Syracuse, N. Y.

(By Invitation)

"THERE is nothing new under the sun" is an old and true adage. While new things may arise, there are often new applications for old things. I beg leave to ask your indulgence if the thoughts expressed in this paper are not entirely new. The purpose is chiefly to emphasize and lay special stress on ideas and facts already known, but not sufficiently heeded by all who should notice them. A mere perusal of the title of this paper suggests the presence of danger. How fortunate that we should live in an age that makes use of the slogan "Safety First!" The railroads have their "Stop, Look, and Listen" signs. We have received the admonition or noticed the sign of "Watch your Step;" the streets of the cities have their traffic officers or signs "Keep to the Right;" shops have been compelled by law to safeguard all machinery. In short, in civil life it has become not alone a necessity, but a habit to safeguard life where there is any possible danger. Have we, as members of the medical profession, taken all the precautions we should have taken? To this we may answer "Yes" or "No." Inasmuch as this paper deals only with operator and anesthetist, the remarks will apply only to them. Surgery, properly considered, is a therapeutic procedure. There is always an element of danger in connection with it, even though a general anesthetic is not administered. The dangers attending surgery and anesthesia have, in great part, been recognized. Much has been done to overcome and prevent them, and investigations are continued to prevent and minimize those dangers which have not yet been conquered. We are all proud to note the safety signs which have thus far been erected to guide surgeon and anesthetist, in

order that the surgical patient may have a safe journey to relief and eventual cure.

To those who have given thought to the matter of safety, there always arises the short-sightedness of our medical colleges in not properly training the medical student in these branches. We appreciate that an anesthetic is administered to allay pain and overcome muscular contractions. The fundamental teaching of this art, as Flagg calls it, must come from the medical school. Dr. Isabel Herb, in her paper, "The Anesthetist in the Hospital Staff," says: "The slogan to be adopted, the safety device to prevent anesthetic deaths, is education." Dr. W. D. Gatch, in his paper, "Anesthesia in Curriculum and Clinic," very forcibly portrays the defects in teaching. He suggests a co-relation of the subjects so that there is a very forceful application of the subject of anesthesia in conjunction with physiology, pharmacology, internal medicine, and operative surgery. As Gatch further says: "Where would the advances in surgery be if it were not for the advances in anesthesia?"

The surgeon requires education just as much as the anesthetist. The real surgeon seeks intensive training under an able leader before he branches out for himself. The question is not only how well an operation may be performed, but, also, how much good will come from the operation. The proper training of both operator and anesthetist, and the working together of both will terminate in good team work and better surgical results.

One can state with perfect safety that team work in surgery has decided advantages. It is, indeed, no longer an experiment, but rather a well-established fact. Encouragement is given the anesthetist, who, being recognized as a full-fledged specialist, takes his place in the surgical team, not alone as the one who administers the anesthetic, but as a consultant. His help weighs in the balance the advisability of operating and the selection of the safest time to operate, and it is he who makes the choice of the anesthetic. He helps prepare the patient for operation. To do all this, the anesthetist must be a trained physician.

The object of a trained surgical team is not alone to prevent death, but to overcome and minimize the discomforts attending surgical operations. This manner of work has brought about specialization in anesthesia, and, in turn, encourages further study toward new and hidden paths that would otherwise remain unknown.

We cannot, to-day, overlook the fact that meetings of this kind, where two or more special branches of medicine come together in joint session, must bring benefit to all concerned. They should be

encouraged, because in such joint sessions the shortcomings of all may be brought out and remedies suggested. This will exemplify the old saying: "Always speak well of yourself; the other fellow will take care of your faults."

As has been stated before, the duty of the anesthetist is not merely to administer the anesthetic, but to help prepare the patient for the operation. When should he begin, and what preparation is needed? If possible, the anesthetist should begin his work when the surgeon has decided that an operation is needed. It is advisable to have the patient in the hospital at least forty-eight hours before the operation. Some cases may require several days, others a number of weeks, for proper preparation. A full physical examination of the patient is advisable. In connection with this there should be a quantitative and qualitative examination of the urine. When possible, a functional test should be made. The examination of acetone before operation is too often neglected. It should be a routine practice. A complete blood examination, including the clotting time, should be made. While it is perhaps rare to find delayed clotting of the blood, we may save ourselves considerable anxiety if this test is made before the operation. The works of McKesson, Miller, and others on "Blood Pressure" show the great importance of this valuable, but too-often-neglected examination. The work of Polak on "Blood Pressure and Phthalein Output" shows very conclusively a *safety first* sign, if properly heeded. All these examinations are mentioned, not for the purpose of creating a mountainous obstacle to surgery, but merely to indicate some of the *safety signs* that, when heeded, will spell success to the surgeon and gain the best end-results for the patient.

At this point, let me speak a word in favor of the great work done in the clinical laboratory. Too little use is made of this in our preoperative preparation of the patient. One of the most trying and obstinate discomforts encountered at times is acidosis. The laboratory will be of great help to us in this condition and proper diet and medication will overcome or mitigate this condition to such an extent that surgery may be undertaken with perfect safety. The laboratory work in diabetic cases is of inestimable value.

Argument is often raised against this preliminary stay in the hospital on the basis that, owing to the great nervousness of the patient, it would cause an unfavorable reaction. This fact is true, if no explanation is given the patient why this extra time is needed. Too much thinking is too often done for the patient, and not enough by the patient. Outside of the great good that accrues to the patient

by these examinations, there are other benefits to be derived from them; viz., becoming accustomed to the hospital, and forming an agreeable acquaintance with the nurse who is to have charge of the case.

Especially in genitourinary surgery does this preoperative care and preparation of the patient show up to the best advantage. Without this preoperative care, some patients were formerly doomed to die without operation; with it, they are now rendered fit subjects for surgery, obtain relief, and, not infrequently, are cured. At any rate, comfort is given to patients who formerly were destined to untold suffering. Another great advance in preoperative preparation is the care given the gastrointestinal tract. The surgical patient is no longer starved and purged. How true the comparison of the surgical patient to the athlete who prepares himself for a race! Let common sense prevail. The better the physical condition of the patient at the time of operation, the shorter and more uneventful will be the convalescence. Giving the patient the usual diet the day before the operation, supplemented, as suggested by Flagg, with one-half pound of chocolate, or some other form of glucose, will help to neutralize the acidosis produced by the anesthetic. Purging or active catharsis is not only useless, but is one of the great causes of postoperative gas pains and distention of the bowels. Our emergency cases, where preparation is impossible, seldom suffer gas pains. The patient should have ample rest before the operation. If necessary, some sedative, like bromide, chloretone, or veronal, should be given the night before the operation to secure a good night's sleep.

Shall we administer preoperative medication? While there is a great deal of argument against it, I believe there is much to be said in favor of it. For a long time it has been my rule to use preliminary medication in the majority of cases. When I use it, I give morphine $\frac{1}{6}$ grain, or pantopon $\frac{1}{3}$ grain, with atropine 1/150 grain in ether cases, and hyoscine 1/150 grain, in gas-oxygen cases. While occasionally I have seen a slowing of the respiration, due to the morphine, I have never regretted its use in a single instance. The value of the administration of morphine or pantopon, both before and after operation, is too little appreciated. There may be a marked disadvantage with inexperienced anesthetists when this preoperative medication is used; but with the experienced anesthetist, who relies on no one sign or symptom to indicate the condition of the patient, there can be no disadvantage. If there is an idiosyncrasy, or known contraindication, no pre-

liminary narcotic medication is used. The length and type of the operation are also influenced by preoperative treatment. Of late, my choice has been to employ the medication sublingually, rather than hypodermatically. The action of the medicine is fully as good, and the psychic effect on the patient is very marked and in favor of the patient.

The next thought after proper preparation of the patient and fixing the time for operation, will be the choice of the anesthetic. It is really surprising to read and hear the differences of opinion as to the best anesthetic. Statistics are of no assistance to us. It seems that certain sections of the country have fads and fancies in the choice of anesthetics. It is true that all anesthetic agents are poisons; it is also true that only experienced physicians should administer anesthetics. We know that ether anesthesia is the safest with the inexperienced. The experienced anesthetist adds safety to nitrous oxide and oxygen. The latter anesthetic is the most pleasant and has the least postoperative effects. Those who use gas oxygen to any extent agree that there are practically no contraindications to its use. A short time ago, I read a paper in which the chief contraindication to gas oxygen was shown to be the surgeon. That still holds true when the surgeon is not accustomed to work with gas oxygen anesthesia. The surgeon who has been in the habit of working with the patient under deep ether anesthesia must first be taught to operate with the aid of gas oxygen to recognize its real value. It means a re-education of the surgeon. Once accustomed to the use of gas oxygen, he will work with as much ease and comfort as he ever did with ether. The appealing factor in this change is the patient. One always hears how pleasant it is to go under the influence of gas oxygen, and how pleasant is the awakening. The surgeon is surprised at the good condition of the patient, even after a long operation. It is conceded that there is not the amount of muscular relaxation with gas oxygen as there is with ether. In a certain class of cases only a small amount of ether may be necessary to produce the desired amount of relaxation. The The success lies in the team work between operator and anesthetist. The greatest objections of gas oxygen anesthesia are made in abdominal surgery, because of lack of muscular relaxation. In great part this will be overcome if the operator will make a sufficiently large incision to begin with, so that he can make all necessary examinations without the use of great force in inserting his hand into the abdomen. The position of the patient on the operating table, to insure the greatest amount of relaxation of the involved

parts, is another feature of importance. Guthrie and others have commented favorably on the use of the Trendelenburg position when starting the anesthetic. This has its advantages in certain cases. Still, there is greater danger in extreme Trendelenburg position, especially in a long-continued operation. Here good judgment on part of the operator is necessary to determine how much and how long the Trendelenburg position will be tolerated by the patient. Proper relaxation of the parts involved may be obtained by properly placing pillows, or sandbags, under the patient. The newer type of operating table is so constructed that relaxation may be accomplished by adjustment.

The one great field that is surely but slowly being invaded by the gas oxygen method on anesthesia is obstetrics. Chloroform has done noble work in this department, and will never be entirely displaced by gas oxygen or any other anesthetic. Chloroform is a very valuable anesthetic agent when carefully used in properly selected cases. Ether will, of necessity, be the agent most extensively employed. Ether has its definite indications, and in many cases its advantages over other anesthetics are clear and undeniable. The difference in cost, no doubt, has been a drawback to the more liberal use of nitrous oxide. Greater experience has thus been gained with ether, which, when properly administered, compares quite favorably with gas oxygen.

Somnoform, which is a combination of ethyl chloride, methyl chloride, and ethyl bromide, is extensively used by dentists. It is of great value in short administrations, and produces greater relaxation than gas oxygen. This combination of drugs is also largely used to begin ether anesthesia. It has the further advantage in not requiring a large apparatus for administration. Ethyl chloride has enthusiastic advocates, as have also ether and gas. Its chief use is for short operations, or as a preliminary to ether anesthesia, especially in children.

The use of oxygen with other anesthetics is of great value. It increases safety without diminishing the value of the anesthetic. It is a stabilizer of blood pressure, it diminishes or overcomes nausea and vomiting, and it facilitates an early return to consciousness. In obstetrics, I have found it of great value in resuscitating the asphyxiated child.

Emergencies are best met when there is team work. It may be necessary, in some cases, to transfuse before operation. The experienced anesthetist can give warning to the operator in ample time to speed the operation, or even cease his work, if the patient's con-

dition becomes threatening. If blood pressure observations are taken during the operation, one will find the evidence of danger long before it manifests itself, and proper measures may be taken to meet it successfully. The anesthetist should know all emergency measures and have them ready for use when occasion demands. The operator, too, should at all times use such speed as is consistent with safety and good technic. All bleeding should be controlled at once. Unnecessary bruising of tissues should be avoided. Surgical shock is a nightmare that, as yet, has not been fully dispelled. The theory of Cannon that it is due to absorbed toxins arising from the bruised tissues, may explain why operations of long duration and severe manipulations are followed by shock. We know that hemorrhage and nerve irritation are causes of shock; but there are some cases of shock that have not, as yet, been satisfactorily explained. No doubt further investigation will, eventually, solve this problem. In the meantime it behooves us to consider all the supposed causes of shock, and try to avoid them.

What care, then, is to be given the patient after the operation? The patient, properly protected, is taken back to a warm bed. Hot water bottles should be placed about the patient to keep up the body heat. The room should be light enough so that changes in the color of the patient can be recognized. The position of the patient in the bed should be such as to afford the greatest comfort. Enough anodyne should be ordered to give relief from pain for the first forty-eight hours. Water should be given as soon as consciousness is fully established. Rectal injection of alkaline solutions, with or without glucose, should be ordered if the case demands them. Feeding should be started at a very early period. Careful watching of the patient is necessary to detect change in color and in pulse rate. Absolute quiet is essential for the first few days.

If the anesthetic has been properly administered, a very early return to consciousness usually takes place. This means that there is a minimum amount of anesthetic for climination. Less time will be required in watching the return of consciousness, and the discomforts attending it will be practically nil.

In conclusion, I wish to emphasize, first: a change in college curriculum to meet the above suggested requirements; second: a greater preoperative care and examination of patients; third: improved team work in our hospitals.

In limiting my remarks to operator and anesthetist, I do not wish to minimize the value of other participants in the operation. There must be a concerted action of all of them in order to insure success.

SOME ADJUNCTS WHICH PROMOTE EFFICIENCY IN THE USE OF LOCAL ANESTHESIA.

BY
ROBERT EMMETT FARR, M. D.,
Minneapolis, Minn.

(With five illustrations.)

(By Invitation)

NOTWITHSTANDING the boon that the discovery of general anesthesia has been to surgery, chloroform, ether, and gas have so many shortcomings and dangers, both immediate and remote, and their use is accompanied by so much discomfort to the patient, that local anesthesia is gradually gaining in popularity. In considering the problem of anesthesia, it is evident, however, that the ideal method has not yet been developed. The virtues of any anesthetic are purely relative.

All general anesthetics produce their toxic effects almost directly in proportion to the amount used and to a large extent the quantity used depends upon the length of time during which the patient is under their influence. While this point is not of special importance in a large percentage of cases, there still remains a fair number in which it is of the utmost importance; a fact which, I think, is not sufficiently appreciated. It is difficult to decide, in a given case, just what part a heavy dose of a general anesthetic has played in an untoward result following a major surgical procedure.

The future will develop a great improvement upon the present method of producing general surgical anesthesia; and local anesthesia is making marked encroachment upon the field. My personal point of view has changed from year to year, increasing experience having invariably broadened the scope of local anesthesia and decreased the field of general anesthesia, even where it was believed absolutely necessary. In this, with few exceptions, my experience has not varied from that of others who have used local anesthesia in a fair percentage of their cases. Increasing experience has made it possible for me to perform, with satisfaction, operations which I formerly believed to belong solely in the field of general anesthesia. Little difficulties have gradually been overcome by methods devised to meet them, with the result that I have been repeatedly compelled to modify my attitude on this subject.

It is with a discussion of the possible scope of local anesthesia and some of the methods which facilitate its use, that this paper will

concern itself. The scope of local anesthesia will depend largely upon the surgeon's attitude, which, in turn, is a fair index of his ability to use the method. The personal equation enters so largely into a consideration of the problem that one can give only his own experience and impressions.

I have arranged my cases in the five following classes: 1. Ideal. 2. Satisfactory. 3. Unsatisfactory. 4. Failures. 5. Mixed cases.

First Class.—In this class we have included only those cases in which the operation was completed without complaint on the part of the patient, and in which, in my judgment, the anesthesia established permitted the performance of the operation as satisfactorily as could have been done under any other form of anesthesia.

Second Class.—In this class we have placed operations in which the anesthesia was good, but in which the patient complained at times, or suffered some inconvenience. Although, in my judgment, the patient was not caused appreciable pain, he failed to go through the operation without complaint. No patient was placed in this class unless the operation was performed with as great as or greater satisfaction than would have been the case with any anesthetic.

Third Class.—Here we have selected those cases in which the operation was completed under local anesthesia, but in which, for some reason, we should consider some other form of anesthesia more desirable.

Fourth Class.—This class consists of those cases in which it was necessary to resort to general anesthesia in order to complete the operation, either because the patient complained of pain, or because general anesthesia was necessary in order to carry out some part of the operative procedure.

Fifth Class.—In this class belong the cases in which the use of general anesthesia had been anticipated, or planned, and in which only a certain portion of the operation was intended to be carried out under local anesthesia.

The record of the last 600 major operations which I have performed serves as a fair index of my present attitude regarding the scope of local anesthesia.

REPORT OF LAST 600 CASES.

		Per cent.
Number begun under general anesthesia.....	49 cases	8.17
Number begun under local anesthesia.....	551 cases	91.83
Cases falling in class one (ideal).....	383 cases	69.50
Cases falling in class two (satisfactory).....	114 cases	20.80
Cases falling in class three (unsatisfactory)...	36 cases	6.50
Cases falling in class four (failures).....	7 cases	2.10
Cases falling in class five (mixed anesthesia)	11 cases	2.00

Elements which have largely influenced me in assuming my present attitude may be enumerated as follows: first; a realization that liberal amounts of novocain can be used if properly safeguarded; second; the development of an improved armamentarium; third; the development of a morale on the part of my assistants and the hospital attachês which, together with the gradual education of my clientelê, greatly influenced the mental attitude of prospective patients; fourth; an improvement in the method of handling the tissues.

At the present, all of our operations are begun under local anesthesia, with the exception of cases in which it would be obviously impossible to control the condition by this method. As may be seen by the above table, this amounts, approximately to 7 per cent. and is confined largely to work about the face and mouth in children, and to adults who refuse a general anesthetic.

While local anesthesia has many shortcomings, because certain operations cannot be carried out under its use and certain patients will not submit to it, it is my belief that faulty technic is responsible for the vast majority of failures. Take, for example, a simple laparotomy for the removal of the appendix or shortening of the round ligaments; a perfect local anesthesia will allow us to complete either operation without touching the viscera within the pelvis, except where it is necessary to attack the round ligaments and cecum. No gauze is necessary for packing off the intestines and all pelvic viscera may be examined as at an autopsy. On the other hand, an incomplete local anesthesia on the same kind of cases will give an entirely different picture. The patient, who is repeatedly hurt during the injection or perhaps has an incomplete infiltration, leaving sensitive areas in the field of operation, will develop in the abdominal wall reflexes over which he has no control and this condition will cause the forcible extrusion of the intestines through the wound as soon as the incision is made. In order to retain the intestines within the abdominal cavity in such cases, pressure by gauze pads is necessary. This in turn produces more pain, which increases the combative action on the part of the abdominal muscles. We have here a "vicious circle," which spells failure for the method in practically every case. The individual who blames local anesthesia or the mental attitude of the patient for this condition can be classified in only one category by those who know what the actual cause of the trouble is; and yet this is what one usually observes when attempts are made to perform laparotomies by this method.

The ideal sought is a complete abolition of the reflexes of the abdominal wall, with complete relaxation, and a negative intra-

abdominal pressure, like that seen at an autopsy. This is accomplished by a perfect anesthetization of the line of incision, painlessly produced, and gentle vertical retraction of the abdominal wall.

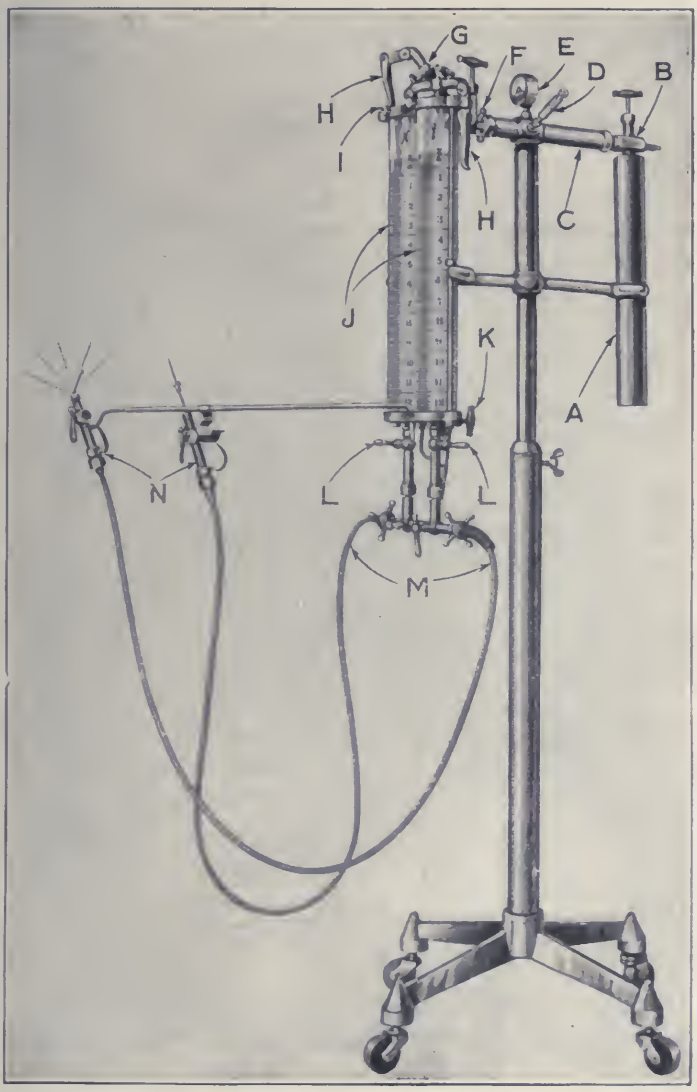


FIG. 1.—Pneumatic injector for use in introducing local anesthesia.

Exposure of the viscera is facilitated by the use of the Trendelenburg position, lateral tilting, etc.

To my mind, the most important point is the careful introduction

of the drug; and it is in the attention to small details that success is achieved. All of the modern text-books or articles on local anesthesia advocate the introduction of the needle at two or more unanesthetized points on the abdominal wall. This entirely unnecessary procedure is apt to disturb the patient at the very beginning and to shake his confidence in the operator, which may not be any too great at best. On the other hand, if the patient is hurt but once, as in making the first dermal wheal and the future sites for the

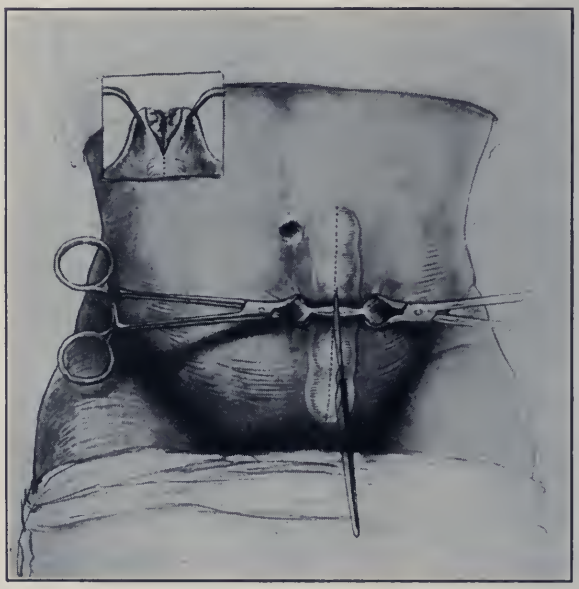


FIG. 2.—Towel clips applied to skin while making incision.

introduction of the needle are anesthetized from beneath the anesthetic may be introduced almost without being felt. Syringes, on account of their jerky action and the muscular effort required on the part of the operator, have been found unsatisfactory for the accomplishment of smooth and perfect work. Even the improved syringe, which eliminates the necessity of refilling, does not give one the opportunity of carefully disseminating the solution into the tissues. The pneumatic injector, which we have used for ten years, gives one the greatest opportunity for easy and painless infiltration of the tissues (Fig. 1).

Once the anesthesia is established, the incision should be made with a sharp instrument, preferably between two towel clips which

elevate the skin and prevent pressure upon the abdominal viscera (see Fig. 2).

During the making of the incision this skin elevation should be continued without intermission and as soon as the peritoneum is opened, all the abdominal viscera will drop away from the site of the incision, provided the anesthesia is perfect (Fig. 3). A Trendelenburg position, with lateral tilting, will expose any organ in the lower abdomen. In the upper abdomen the entire stomach, gall-bladder, duodenum, liver, and colon may be examined visually as well as digitally. The patient can of his own volition show the gall-bladder

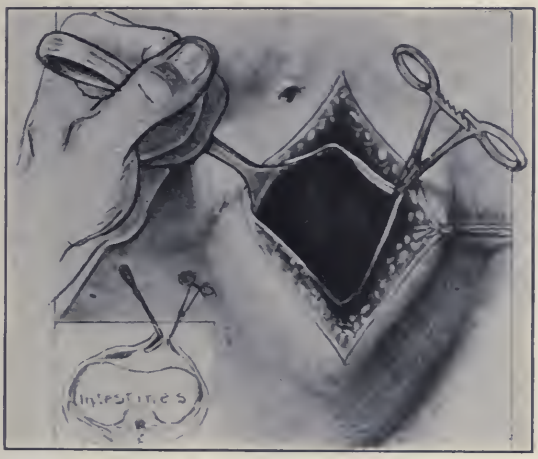


FIG. 3.—Showing vertical retraction of abdominal wall—see especially cross-section in lower right hand corner.

or stomach to the onlookers by an expulsive effort; and, by opening the mouth and relaxing, can allow these organs again to drop back into the abdomen. It is desirable to substitute suction for sponging. Abdominal packs are used only when there is danger of soiling; the packs are simply laid upon the viscera, and not forced with great pressure against the serous-coated organs, as is so commonly practised when the patient is under general anesthesia.

TECHNIC.

In all of my abdominal work, except in the operation for inguinal hernia, a direct infiltration of the tissues is effected and the complete infiltration of the abdominal wall is made before the incision is begun (Fig. 4). This method is chosen because of its efficiency, simplicity, accuracy, and speed. This direct method is not used

in the case of inguinal hernia because the infiltration of the tissues obscures, to some extent, their anatomical relations.

Visiting surgeons frequently inquire regarding the danger of introducing the needle directly through the abdominal wall and injuring the abdominal viscera. This danger is practically *nil*, as has been proved in thousands of instances in human as well as animal surgery. If the needle is advanced slowly, and a stream of the solution is constantly forced ahead of the needle point, the peritoneum will seldom be penetrated. This point has been proved by using solutions colored with methylene blue.

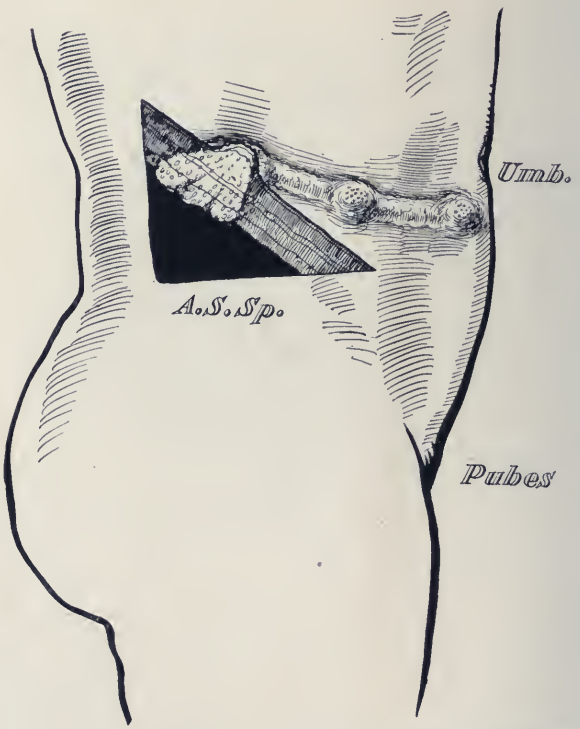


FIG. 4.—Section of abdominal wall, showing area infiltrated.

Once the abdomen is open, vertical retraction, tilting, and careful manipulation of the tissues are the main strategic points. Sensitive visceral surfaces, such as are found in the round ligaments, the mesoappendix, about the uterine cervix, the ovarian pedicles, and the cystic duct of the gall-bladder may be anesthetized before being attacked. Long, fine needles, mounted upon the ball-and-socket joint of the cut-off as shown in Fig. 5, should be used where one

wishes to make infiltrations deep within the abdomen and the hand does not obscure the view. Suction is substituted for sponging, which may cause a disagreeable sensation. Where traction on the pelvic viscera is anticipated, as in the case of bad infections or malignancy, caudal anesthesia precedes the infiltration of the abdominal wall.

Vicious, forcible retraction is to be condemned. In this work we employ a wire automatic retractor. I believe that visual examination of the abdominal organs is much more advantageous than digital. Extensive abdominal operations performed

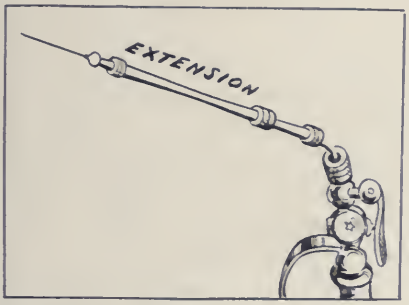


FIG. 5.—Shows extension attached to cut-off for use in deep cavities.

under local anesthesia, if done painlessly, usually show a patient with a pulse rate below 80, no sweating, normal respiration, color, and temperature, and an unchanged blood pressure at the end of the operation. The elimination of trauma to the abdominal wall and viscera insures, almost without exception, a smoother convalescence than I have been able to obtain under the use of general anesthesia. My experience leads me to believe that postoperative ileus and gas pains are, in the absence of infection, directly proportionate to the amount of trauma employed during the operation. Nausea, thirst, and vomiting, with their disagreeableness and annoying sequlæ of wound strain and pain, are largely eliminated.

When one is operating upon children under local anesthesia, restraint is necessary while the anesthetic is being introduced, which may be employed without in any way interfering with the technic of the operation. My experience in more than 100 operations, performed on children under the age of fifteen, shows that the restraint necessary is, probably, less than 10 per cent. of that required during the administration of a general anesthetic, and that this class of patients lend themselves exceptionally well to this form of anesthesia.

SURGICAL BARRAGE.

BY

CHARLES W. MOOTS, M. D.,

AND

ELMER I. McKESSON, M. D.,

Toledo, Ohio.

(With one illustration.)

THE greatest protective development in modern warfare was the so-called "barrage." To be effective, every minute detail was worked out with the greatest precision. To begin a few seconds too early or too late meant not only a possible failure, but even worse, destruction of one part of an army by another part of the same army. Team work was absolutely essential.

A surgical barrage may be defined as the process of surrounding the surgical patient with all the skill and refinement known to specialists in the various departments of medicine and surgery during the preoperative, operative, and postoperative periods. Surrounded with such a barrage, the patient may reasonably anticipate the lowest possible mortality rate, with the shortest and least uncomfortable morbidity period, the latter factor becoming more and more the aim of every thoughtful surgeon. It is our hope briefly, yet concisely, to bring before you certain of the elements making up this barrage, basing our conclusions not upon theory, but upon experience.

First of all, we have already noticed a marked advance in the safety line to the patient by the work started by the American College of Surgeons in the standardization of hospitals. This not only means a general awakening of hospital managements, thereby increasing the efficiency of the hospital, but is destined to have an enormous influence in standardizing surgery itself. Hospital managements, when selecting a staff, are beginning to give occasional thoughts to some qualifications other than a reckoning of the number of pay patients the proposed member has been rushing to the hospital. It is to be regretted that, in the past, the latter motive has all too frequently actuated the selection of staff members by many institutions, especially those of a sectarian type.

We regret, however, that the officers of the College have apparently overlooked one important factor in their otherwise valuable standardization work, and in a few instances have even given their individual influence to lowering of standards. We refer to professional anesthesia, which we shall discuss farther along in the paper.

In the field of gynecology, much is gained for the patient, as well as for the profession, by a close alliance of surgeon and psychiatrist. The patient has been taught many foolish and untrue things about herself, and the relations of her sex organs to the entire endocrine system as well as to the nervous system are so complex that frequent consultations with a properly trained neurologist will often avoid useless and even harmful surgery.

The gynecologist probably comes into contact with a higher percentage of chronically ill patients than does any other surgeon. He must therefore consider with unusual care the preoperative and postoperative periods. Everything possible must be done to raise the patient's physical condition to the highest point of resistance, and her psychology must receive special attention. She should reach the hospital and be received, whenever possible, without an unpleasant experience. Immediate preoperative purgation is to be avoided. Fluids, especially alkalines, are given freely. A good night's rest is assured by the use of sedatives, and, if absolutely necessary, some narcotic.

We assume that a positive diagnosis has been made, if such is a human possibility, and the work well planned before the hour of operating. This bespeaks smooth, rapid surgery, without bungling haste. All known means should be used to measure the patient's resistance, including carefully acquired knowledge of the kidney function and cardiovascular system, as well as metabolism in general. We still continue to attribute much importance to the pulse pressure ratio, a term used to indicate the relation between the pulse pressure and the diastolic pressure, which we discussed at length in a former paper read before this society.

We have made systematic use of the principle ever since that time, just as we did for some years previous to the report. All cases are recorded, and the records comprise most interesting data for study. Dr. Miller, of Providence, R. I., has recently reported, a trial of our plan in 1000 consecutive cases, and stated that he has found it correct and of much value. In the same article, Dr. Miller puts forth an idea that we have adopted and have found to have much to commend it. He divides his cases into three classes, as follows:

The good risks: patients free from organic disease, whose surgical condition is not likely to prove fatal.

The fair risks: patients who are suffering from organic disease, but whose surgical condition is not especially serious.

The poor risks: patients whose surgical condition is so serious, or so far advanced, as likely to result in a fatality.

All patients of the first class are expected to recover. If a fatality should occur from among this class, the case should be carefully investigated to determine whether the preoperative prognosis was in error, or whether the work of the surgical team is to blame for the fatality.

As an example of the second class, an operation for appendicitis might be urgently required in the case of a patient whom the examination showed to be affected with diabetes. If coma and death follow an operation under such circumstances, the fatality must be considered beyond human control. If no examination and no prognosis had been made in a case of this kind, the necessity for a lame explanation of the result would have arisen.

With this classification we are now ready to consider the question of anesthesia. Shall it be local or general? If the latter, what agent is to be used? Any surgeon who insists that there is but one form of anesthesia, or only one anesthetic, is too narrow to be a real student. If one classifies his patients as above, and seriously considers the sort of an operation he is going to perform, he will soon find need of several forms of anesthesia and several anesthetic agents.

It is not our purpose to discuss at this time the question of local anesthesia; but before passing it, we wish it to be understood that, in our judgment, it may be used in the future much more than it has been in the past, owing to great improvement in the technic of its administration. Personally, if I were without the services of a professional anesthetist who was especially skilled in the use of nitrous oxide-oxygen, I would do a larger percentage of my work under local anesthesia.

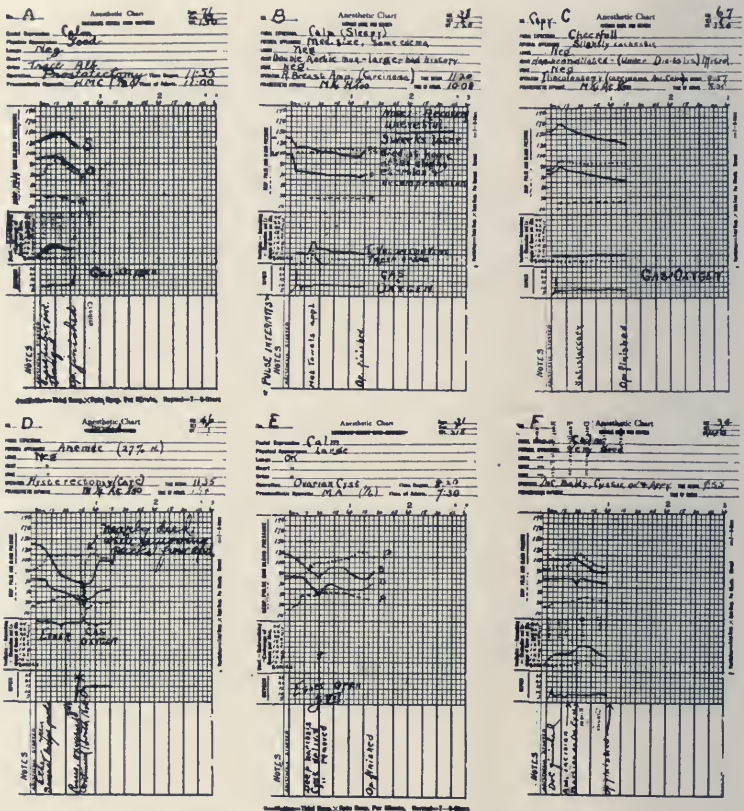
Ether has practically solved the question of immediate mortality rate when properly administered, and is certainly the safest general anesthetic agent in unskilled hands. It also makes toward easy surgery. There are a few factors about it, however, that do not please the surgeon who is looking for ideal anesthesia. The odor from it during, as well as following, the operation does not leave pleasant memories in the mind of the patient. The awful nausea, the interference with the function of cells and organs as proved by

the laboratory, delayed deaths—not conscientiously attributable to the surgical traumatism alone—are things we like to avoid.

In 1907 we became interested in nitrous oxid-oxygen. At first our difficulties were many, ignorance of the necessity of joint study and coöperation between surgeon and professional anesthetist, poorly devised equipment for administration, lack of experience in the signs of anesthesia produced by this agent, lack of ability on my own part to operate with minimum traumatism being the principal causes in the light of present knowledge. With these propositions mastered, I am to-day happy in the conscious enjoyment of a technic which leaves little to be desired. However, the kind of anesthesia and the agent used to procure it are secondary in importance to that of the anesthetist. Indeed, we believe a professional anesthetist is the most important factor in the surgical barrage.

We have considered all the arguments ever offered in favor of the nonprofessional anesthetist, and, in times past, was inclined to admit that, in some of them, there existed a partial truth; but with our profession just home from the war, and such a good percentage of them ready to devote their lives to the study and practice of anesthesia, there now exists no reason why any surgeon who is *unselfishly* devoted to raising the standard of hospitals and surgery should encourage in any way nonprofessional anesthetists. All pro-arguments, when well-analyzed, fade away; and a new light upon the screen shows the real cause of the blustering arguments; viz.: "The surgeon in the big clinics was not happy in the thought of a fair fee going to a professional anesthetist. The surgeon in the smaller cities hoped to encourage the family physician to send him more cases by having him give the anesthetic." And it is quite probable that the surgeon has sometimes used the matter of anesthesia as an excuse to give the practitioner a fee somewhat larger than the skilled anesthetist would have charged the patient.

The question of the advisability of nurses administering anesthetics has recently been brought up before the profession. After an impartial study of the subject we have come to the conclusion that, while many nurses may be taught to administer the safer agents in uncomplicated cases in a manner highly satisfactory to the operator, the principle is fundamentally wrong for reasons so numerous that we hesitate to embody them in this paper. We still maintain that the administration of a general anesthetic is the giving of the most powerful and dangerous drug at a most perilous moment of the patient's life. During any major operation the anesthetist may be called upon to make one or several new diagnoses and prognoses; and this,



A.—Illustrates the physiological rise and fall (*S*) systolic and (*D*) diastolic blood pressures with the (*P*) pulse rate. Note that the respiration reacts similarly.

B.—Inability of an embarrassed heart to react to vascular depression shown by the initial fall in pressures *without* increased pulse rate. After an uneventful convalescence, the patient died three weeks later from heart decompensation brought on by walking up stairs.

C.—Mitral disease primarily—note abnormal pulse pressure or stroke unfitting the heart for long strains requiring greater circulating volume. Satisfactory convalescence.

D.—Shows the progressive development of cardio-vascular depression—first, second, and third degree—under ether narcosis and the added depressing influences of surgery, abdominal packs, etc., with collapse from removing abdominal packs at the greatest degree of depression necessitating resuscitation with oxygen, and continuation of narcosis with gas-oyxgen. Although the pulse remained rapid, the blood pressure gradually recovered so that the third degree depression was not continued until the vicious cycle was established. Patient recovered. The anemia alone should have precluded the use of ether in this case.

E.—Second degree depression. Large ovarian cyst requiring considerable traction and with the deep narcosis associated with respiratory and cardiac exhaustion from their excessive work are prominent features. During the last 15 minutes the patient had developed third degree depression but recovered—dangerously near the fatal period for third degree.

F.—Note the rise in pulse rate, respiration and ventilation with traction on the ovarian cyst while the diastolic notch warns of the slight (first degree) circulatory depression which follows. Not infrequently observed.

certainly, constitutes the practice of medicine and demands unusual skill.

Few surgeons know much about the subject of anesthesia because the subject has not been properly taught in our colleges and hospitals. Our hopes, therefore, lie in the encouragement we give the specialty of professional anesthetists. To them we must look for advances in their line. They must be considered in our discussions during the preoperative as well as the operative period. We commend the report of the Committee on Anesthesia of the American Medical Association stating: "Every hospital, certainly ever large hospital, should have as a regular member of its staff an attending anesthetist, whose authority in his special branch should be as complete as that of the attending surgeons in theirs."

What is meant by a qualified, professional anesthetist? For answer, we quote from Dr. Isabella C. Herb. "The qualified anesthetist is one who is capable of making a physical examination of the patient, who can interpret laboratory findings, who is familiar with operative requirements, and who is able to weigh the evidence and select the most suitable anesthetic and the method of its administration for the particular case under consideration. These qualifications require not only a thorough medical education, but special training in the theory and practice of anesthesia as complete as is required in the field of surgery or its correlated specialties."

It was with extreme regret upon my part that upon the return from the war-ridden countries, we found the legislature of our own great state, Ohio, legalizing nonprofessional anesthesia. Already we hear the jeers of the nonmedical cults concerning the all too apparent insincerity of some of our leaders regarding their desire really to raise the standard of the medical profession.

Another factor of much importance to the patient is that of the length of time required for the operation. While we are not advocating bungling haste, it is certainly safe to conclude that the briefest possible time only should be utilized for any surgical procedure. All other factors being equal, the morbidity period should be in ratio to the operating period.

There is a certain period in every operation, varying in time in every case, that may be termed the *safety period*. The operator who knows anatomy and can operate easily with speed, will save the life of many border-line cases that would be lost by a slow operator who requires time far beyond that of the safety period.

I have had no experiences, either during my service in the Navy

or in my private practice that have caused me to change my attitude upon the question of sutures. The suture material should be absorbable, of the smallest possible size necessary to carry out its function, and so prepared as to be absorbed as soon as its purpose has been attained.

The subject of shock is an important one, and should be considered in every abdominal section. Many brilliant discussions of the causes of shock are to be found in recent literature, and will not be reiterated here. I believe, however, that much practical good may be gained by keeping constantly in mind three factors: pathology, surgery, and anesthesia.

As cardiovascular depression is the outstanding symptom of the condition known as shock, it is logical to start with the proposition that whatever means enable us to determine the very beginning of this condition, are of the greatest importance.

When a cardiovascular system is reacting normally, an increased pulse rate is accompanied by increased systolic and diastolic blood pressures, and *vice versa*. The pulse pressure is, roughly, half as great as the diastolic pressure, and is the most direct evidence we have of the amplitude of the heart contraction, the best evidence of effective blood movement. In normal sleep, the pulse rate and blood pressures are lowered, but their normal relationships are maintained, so are they in an ideal anesthesia.

But during surgical operations, so many disturbing factors enter into the normal reaction of the circulation, that we may have many combinations with almost never a true *stimulation*, but very frequently a *depression* of the circulatory system. The changes occur frequently with varying, sometimes disastrous results. Nothing is more desirable than to be able to differentiate between these changes and to anticipate them.

There is no form of anesthesia, there is no age of patient, there is no type of operation in which one expects to see an elevation of blood pressure during the operation. Our fears are from low blood pressure, rapid pulse rate, and heart fatigue.

Circulatory depression or decompensation is best divided for surgical operation into three degrees:

1. Safe. Ten to 15 per cent. increase in pulse rate without change in pressure. Ten to 15 per cent. decrease in blood pressure without change in pulse rate.

2. Dangerous. Fifteen to 25 per cent. increase in pulse rate, with 15 to 25 per cent. decrease in blood pressure.

3. Fatal. Progressively increasing pulse rate above 100 with

progressively falling blood pressure of 80 or less systolic, and 20 or less pulse pressure, for more than twenty minutes.

The first degree is never fatal; but it may gradually merge into the second degree. Beginning shock may be regarded as dangerous in the sense that it exhausts the heart and disarms it for defense against continued low blood pressure.

The second degree is always dangerous to the life of the patient. A vicious circle is established, consisting of the low blood pressure, the reduced heart nourishment, which, in turn still further reduces the blood pressure, and so on progressively. This usually develops within 20 minutes after the third degree depression occurs, and, when well established, proves fatal at once or, at most, within three days. The time in which shock proves fatal depends upon the cardiac muscle reserve and the effectiveness of the treatment employed.

Third degree depression may be present in a patient without the usual alarming signs, but after the vicious circle is established, evidences of shock become well marked.

The palpating finger, no matter how well educated cannot determine all the characteristics of the pulse or the pulse pressure with sufficient accuracy to be of much prognostic value as to the onset and degree of circulatory depression during a surgical operation.

Blood pressure and pulse determination taken every few minutes during all of the more serious operations, as well as in many of the so-called minor cases, are part of the duties of every anesthetist. The information regarding the patient's fitness for the operation, his reaction to certain procedures, and the immediate prognosis, can be gained in no other way with the same degree of accuracy.

The procedure is made convenient and easy by fastening the blood pressure cuff to the right arm and snugly binding the stethoscope below it with elastic webbing. Readings can then be made at will without disturbing sterile sheets and without losing the continuity of anesthesia.

A suitable graphic chart is preferable to a record because the tendencies of the circulation are readily compared from time to time; and because the prognosis, based upon these tendencies and the character of operative work to follow, can be more accurately made.

Where nitrous oxid-oxygen was available in skilled hands, the war corroborated our previous observations that this form of narcosis is one of the best shock prophylactics we have.

It is not remarkable that nitrous oxid-oxygen should be safer

in shock, and in preventing shock, than other anesthetics, when one recalls the fact that muscle cannot be paralyzed with it.

The greatest responsibility of the anesthetist is to avoid relative over-dosing of the patient in an effort to please the surgeon who may be demanding a flabby musculature.

The relaxation is not confined to striated muscles of the abdomen and extremities, but extends to the striated muscle in the heart. The effect is at once reflected by the pulse pressure and, if pushed too far, the diastolic is also decreased, showing the action upon smooth muscle as well.

The clinical study of blood pressure has convinced us that the final factor in shock is muscular exhaustion or an interference with muscular action. One thing is most apparent: the average patient, having been profoundly anesthetized for extreme relaxation, is half shocked, a second degree depression—and it often takes but little trauma to complete the picture of third degree depression.

We might go on discussing the relation of pathology, of surgery, and of anesthesia to circulatory depression, and nearly all I could say would be old and familiar to all. Yet it would be of no value to John Doe if blood pressure determinations were not made during his operation to check up the technic of every member of the operating team that no unnecessary damage be done to him. In other words, let us practice some of our knowledge in preventing shock.

We believe that there is a general knowledge of the advantage of professional anesthesia, and that this factor will soon be within the reach of the majority of good surgeons. If, added to this great aid, the surgeon considers well the psychology of the patient, avoids active preoperative purgation, keeps the patient warm, and has her well filled with fluid, discreetly uses morphine, understands the pathology before him, does rapid, bloodless, untraumatic surgery, he surrounds the patient with an effective barrage.

The postoperative period is characterized by the absence of meddlesome medication; by keeping the body warm and properly supplied with fluids, especially alkaline, and often by adding dextrose; by seeing that all wound dressings are exceedingly light and cool; by absolute quiet for infected and traumatized cases, while clean, abdominal, and pelvic cases should be moved about and gotten up much earlier than formerly. The opportunity offered the surgeon to benefit the patient by his advice and suggestions during this period should be used with much thought and intelligent discretion.

THE ADVANTAGES OF NITROUS OXID-OXYGEN IN LABOR.

BY

CHARLES E. TURNER, M. D.,

Obstetrician to Mt. Carmel Hospital, Columbus, O.

(By Invitation)

CHILDBIRTH should be looked forward to with pleasure and ought to be relieved of everything that carries an element of fear. If we wish to have a high-grade infant, we must have a quiet physical maternal mind. Women should not be forced to endure the agonizing pains of labor.

Recent literature informs us that over twenty thousand women die in the United States every year from preventable causes of childbirth and that hundreds of them are rendered invalids from the same cause. The nervous and physical exhaustion which has always come with motherhood in the past must be displaced by a sense of happiness which will fill the new mother's heart with joy and courage. To me it is a constant source of pleasure to see motherhood robbed of its terrors.

Statistics show that the number of stillbirths has been greatly reduced by the administration of continuous analgesia to the mother. The number of stillbirths in this country, in the cases of men who are using painless labor methods, is about 1½ per cent.; while under the old regime the average number of stillbirths seems to have been about 5 per cent.

Humanity demands relief from the tortures which characterize the old-time methods. The time has come when women will not endure needless suffering. We have at our disposal an ideal analgesic that will carry the woman through labor with little or no pain. She is spared the knowledge of agonizing pain, and she emerges at the end of labor with every vital energy intact and with no remembrance of suffering.

The use of nitrous oxid in obstetrics has come to stay. We are much better informed as to its application, and the laity are beginning to understand its virtues. In October, 1917, I wrote a paper, published in the *American Journal of Surgery*, on the results of the

use of gas as an agent for the production of analgesia. Since then there seems to be a greater realization of its merits.

The administration of gas in all of our cases was done by our anesthetist. The technic is very simple, but it requires perfect team work on the part of the anesthetist and the obstetrician.

In the primipara the administration of gas is begun just about at the termination of the first stage of labor. In the multipara it is well to begin a little before the completion of the first stage. About three hours should be the limit in the administration of analgesia. Where a long tedious first stage is anticipated, much relief may be gained from the administration of scopolamin and morphin hypodermically.

The administration of gas is begun at the onset of a pain; if possible, before the contractions are fully realized by the patient. Instruct the patient to breathe deeply and quickly, and to raise her hand at the beginning of each pain. Failure to follow this rule militates very seriously against success. Some obtain a satisfactory degree of relief with three or four breaths, while others find it necessary to take more frequent inspirations. The percentage of gas used varies in different patients; but the administration of nitrous oxid alone should be permitted only when few breaths are necessary to produce analgesia. Oxygen may be added in varying quantities, but the average case does very well with from 5 to 10 per cent. Rebreathing should be avoided while the child is within the uterus. The patient should not be permitted to pass beyond the zone of analgesia. If this occurs, we lose the patient's coöperation. Avoid cyanosis at all times.

As the end of the second stage approaches, we permit a little more gas with each pain. In many instances the addition of a little ether, through the gas machine, promotes relaxation of the mother's soft parts; this condition makes it easy for the head, and delivery may be accomplished without danger to the perineum.

When the use of gas was first proposed as an agent for the production of analgesia, some thought its administration very simple, and that it could be safely administered by anyone. I was never of this opinion. Satisfactory analgesia requires skilled technic; it means an expert anesthetist. Defective analgesia is to be condemned; it discredits the procedure. I have had no experience with the method of so-called self-administration. I have seen it practiced in an Eastern hospital with gratifying results; but I still favor the expert administrator.

The administration of gas does not diminish the frequency or force

of uterine contractions; in fact, as the pains of the second stage are so much subdued, we find the patient quite willing to make use of the accessory muscles of explusion. This is especially true of the more intelligent class of women; they understand that it will shorten labor. Nitrous oxid should always be selected for prolonged anesthesia.

Sir James Y. Simpson, in 1847, speaking in defense of painless labor, said: "Pain in excess is destructive, and even ultimately fatal, and the great pain accompanying parturition is no exception to this pathological law."

Simpson believed that the pain of childbirth could be lessened by anesthesia without interfering with the natural course of labor. He demonstrated this in 1847, when he delivered the first woman under the influence of an anesthetic. It was at this time that he began the use of chloroform, and for many years, and even at present, this anesthetic is almost exclusively used for this purpose.

Keep and Morton of Boston, and Dubois of Paris began the use of ether at this time. The first treatise on the advantages of chloroform appeared in 1854. In 1878, Pinard wrote upon "The Comparative Action of Chloroform, Opium, Morphin, and Chloral on Women in Labor." Chloral is of little value. Morphin is only an adjunct to other remedies. In Edgar's edition of Winckle's book on midwifery, 1890, we find observations which foreshadow our practice of to-day.

The lack of a proper apparatus and the careless selection of anesthetists are the cause of the failures attending, and fatalities following, the administration of nitrous oxid. It has been proved beyond reasonable doubt, that, when the gas is properly given, no ill effects occur to either mother or child. The systemic effect varies with the amount of nitrous oxid given. The blood pressure is only slightly increased, while the circulation of the blood and respiratory movements are rarely disturbed. This, of course, refers only to the analgesic stage. Quite recently I have seen it act as an antispasmodic in a very nervous primipara. The cases in which we observe disturbances of the cardiovascular function are those where the analgesic line has been passed.

What do we mean by analgesia? It is the loss of the sense of pain without the loss of the sense of touch and consciousness. It is brought about by the depression of pain perception; its intensity depends largely upon the amount of nitrous oxid administered. Patients always retain their mental faculties during the production of analgesia. Gas-oxygen is selected for labor cases, because the

function of the voluntary and involuntary muscles remains intact. This condition guards against postpartum hemorrhage.

During the administration of the gas the fetal heart should be examined every half-hour. If nitrous oxid has been properly administered, the lying-in period runs a most favorable course, and everything points to a rapid convalescence.

The advantages of nitrous oxid over the so-called "twilight sleep" are:

1. A shorter second stage of labor during which the patient uses all her efforts to expel the child.
2. The relaxation of the mother's soft parts minimizes the dangers of perineal tears.
3. A total absence of restlessness and rigidity.
4. The rapid return to a normal state after the mask is removed.

Having used this analgesic for some years, I am enabled to offer five good reasons for its value:

1. The entire second stage is practically painless.
2. There is no exhaustion.
3. The postpartum psychoses are greatly lessened.
4. There are fewer lacerations of the mother's soft parts, especially of the perineum.
5. Healthy babies are delivered.

Convalescence is rapid; this, of course, depends to some extent upon the nature of the delivery. Involution takes place promptly, and the patient's recovery is uneventful. The function of the breasts is not disturbed by the use of gas-oxygen.

Ordinarily the patient takes gas-oxygen very readily. The uterine contractions push the head farther and farther down into and through the pelvis, and it is finally born without much pain. In fact, labor is in all respects normal. As a rule, the multipara, who has experienced the older methods of delivery, is better satisfied when delivered with the aid of gas-oxygen.

It is not good practice to begin narcosis early. It is better to explain to the patient what the term analgesia means. If this is done, you will find that the great majority of the patients will respond quickly to the action of the drug. The pain is greatly reduced, but not entirely suppressed. Each case must be individualized. I have known women to cry out during labor, but later to admit that they felt no pain, and that they were only afraid it would hurt.

As I have said before, unhappy end-results are usually the

consequence of an unskilled use of gas-oxygen. Gas should be administered in small doses, gradually leading the patient up to the point of analgesia. When this is accomplished, you will have her coöperation.

Observations by many obstetricians and anesthetists prove that very little nitrous oxid is transmitted to the child *in utero*, for the simple reason that the gas is administered only at the beginning of each pain, as the uterus is then in the initial stage of contraction, the fetal circulation is not affected by the gas-oxygen. I am rarely obliged to resort to artificial respiration; as a rule the babes cry out lustily immediately after birth.

Gas-oxygen may be given for many hours without any ill effect. My longest experience with it was about three and one-half hours, and very little difference was noticed in the patient's physical or mental condition after its use. It is better to begin early than to wait until the patient has suffered for hours, or till near the end of the second stage. When the gas-oxygen is used very late, especially in highly neurotic patients, the end-results are bad.

Gas-oxygen has a peculiar control over the progress of labor. There is no doubt of its efficiency in the second stage of labor when given for its analgesic effects. It relaxes the muscular structures to a degree comparable to normal sleep. The analgesia depends upon the amount of gas absorbed, the average mixture being 90 per cent. gas and 10 per cent. oxygen.

The nerve centers presiding over the five physical senses are affected, one at a time, in recognized and constant sequence. The sense of touch and feeling are the first to disappear; the sense of hearing is the last. The state of analgesia begins with the suppression of the nerve centers affecting feeling, and continues until the last acute sense has been suppressed, when anesthesia has been induced. The patient remains susceptible to suggestions long after the sense of touch has been put out of commission. Because of this the patient will carry out her part of the program at any time after analgesia has been established.

Women of intelligence are the most satisfactory subjects. Most of the trouble we encounter is with the mentally indolent class, or those of sluggish minds. A highly nervous woman may give trouble at the start, but after she has become acquainted with the surroundings, and with what the process means, a fair degree of success is accomplished.

First deliveries, under any system of management, are nerve wrecking. Most satisfactory results are obtained with multiparae

delivered by other methods; they know what they suffered in a previous labor. The most unsatisfactory cases are usually primiparæ simply because they expect too much.

The use of other remedies in connection with analgesia is of importance. Morphin is the ideal sedative during the first stage. I do not give it late in this stage, nor early in the second stage of labor, because it is apt to harm the infant. I instruct the nurse to give a dose of morphin four to six hours before the expected delivery. I have seen it given late only once, and then the child was born greatly asphyxiated. Resuscitation was very difficult. Morphin depresses the sensory nerves and often causes an annoying delay of labor in the beginning of the case. When pains are very severe, it is best to depend upon an occasional inhalation of gas-oxygen than morphin.

The whole aim at the end of the second stage of labor is to obtain a uniform relaxation of all muscles and to enable the patient to throw into activity all her expulsive power. The accoucheur must have complete control over his patient at this time, so that he may be able to deliver the head with proper precautions. The descent of the head during the second stage of labor may be hastened by the use of pituitrin. When analgesia does not relieve the patient of restlessness and nervousness at the time the head impinges upon the perineum, slight narcosis is induced. Analgesia, as a rule, controls the patient much better without a narcosis, and it is more satisfactory to have continuous analgesia for one-half hour previous to the delivery of the head.

FORCEPS AND ETHER.

I would always advise the administration of ether when complete relaxation is desirable. This applies particularly to the use of the forceps. It is better to deliver carefully with forceps under ether, than to perform some other operation upon the soft parts for the release of the head.

Analgesia affords no protection against lacerations to the cervix or vaginal walls. As the end of the second stage approaches, the addition of a little ether through the gas machine is advisable, as it promotes relaxation of the soft parts and makes it easy to control the advancing head.

I do not endorse nitrous oxid anesthesia in forceps operations. I am opposed to the rebreathing idea prior to delivery; and without rebreathing it is difficult to secure even a moderate degree of relaxa-

tion. There is not much advantage in gas-oxygen-ether practice. It is better to depend upon ether alone to secure complete relaxation.

Very little is to be said of local anesthesia. I have injected novocain into the perineum with very little result. It must be used when the head is very low, and then it is difficult to reinfiltrate the parts sufficiently. Novocain has very little value in the analgesics of childbirth.

COMBINED ANESTHESIA FOR REPAIRS.

A mixture of ether and nitrous oxid works admirably in primary perineorrhaphy. It is sufficient to give to the point of narcosis. Minor repairs, like lacerations of the perineum of the first degree, can be repaired under gas-oxygen alone.

FATALITIES UNDER NITROUS OXID.

To discuss deaths occurring under the influence of nitrous oxid, is to open one of the moot questions of anesthesia. I am prepared to say, however, that death from nitrous oxid invariably results from asphyxia. Still, asphyxia seldom occurs when gas-oxygen is administered by a competent anesthetist. Many believers in this form of anesthesia advocate the use of gas-oxygen in cardiovascular disease, because it is less dangerous than any other anesthetic. When I have this condition to deal with in labor cases, I terminate the act of parturition as quickly as possible. Blood pressure changes vary from 5 to 10 mm., but mount rapidly with the occurrence of cyanosis. We must stay away from the asphyxia stage, for a patient with a myocarditis is liable to apoplexy or an acute dilatation of the heart at any moment.

POSTOPERATIVE ANALGESIA.

BY

BERTHA VAN HOOSEN, A. B., M. A., M. D.,

Acting Chief of Obstetric Department, Loyola Medical School, Chicago, Ill.

(By Invitation)

POSTOPERATIVE analgesia means a painless convalescence for surgical patients. Attention to every detail before, during, and after operation, especially from the standpoint of pain production, will develop an analgesic technic which will reward the surgeon for his time and trouble. This technic should be directed toward the prevention rather than toward the relief of pain. It should include the avoidance of psychic trauma previous to operation and tissue trauma during operation. Gas pains, thirst, emesis, and catheterization must cease being necessary certainties and become avoidable and infrequent occurrences.

The first step in the technic should be to prevent psychic trauma before operation. This is done by informing the patient that, when she goes to the hospital on the afternoon previous to the operation, she will have a blood and urine examination, a liquid supper, and a thorough flushing of the bowel in the evening. Very early the next morning the nurse will give a hypodermic injection and another an hour later. After the second injection the patient will sleep so soundly that she will not know, or care, when she is taken on a cart to the operating room and prepared for the operation; the operation will be performed, and she will be taken back to her room and will continue to sleep for several hours. When she awakens, she will be so free from pain that it will be difficult to believe the nurse who says that the operation is over.

In more technical language, the surgeon will use scopolamine morphine anesthesia, no catharsis before or during the week following operation, and all preparation of the field of operation, including catheterization, will be done in the operating suite one-half hour after the second hypodermic injection of scopolamine morphine.

Scopolamine morphine is the only anesthetic that gives a perfect means of preventing psychic trauma previous to operation, and unlike any other anesthetic, it is followed by a period of analgesia

varying from eight to twelve hours after consciousness has been regained.

It may be desirable to continue the analgesia for a longer time. If so, it can be done by prescribing scopolamine $\frac{1}{200}$ grain with morphine $\frac{1}{32}$ grain, or scopolamine $\frac{1}{400}$ grain with morphine $\frac{1}{64}$ grain every four hours, beginning about four hours after the operation and continuing for twenty-four, thirty-six, or forty-eight hours, according to the probable length of the period of postoperative

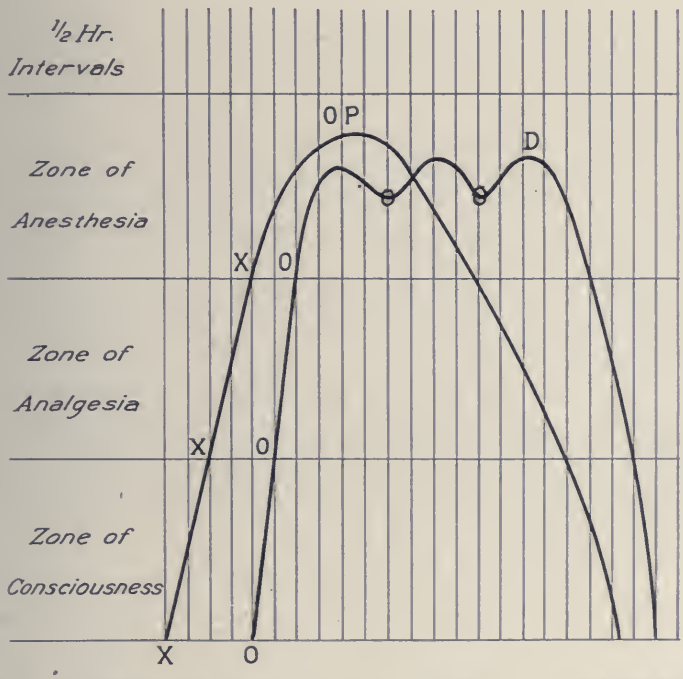


FIG. 1.—Showing production of and relation between the anesthesia and the analgesia obtained by the administration of scopolamine with morphine. X indicates scopolamine, gr. 1/100, morphine, gr. 1/4. O indicates scopolamine, gr. 1/100. OP indicates operation. D indicates delivery.

pain. Convenient hours for giving this postoperative twilight sleep (for that is really the condition produced) are 12–4–8 A.M. and P. M.

The production of and the relation between the anesthesia and the analgesia obtained by the administration of scopolamine with morphine are more graphically presented by a diagram.

To avoid mistakes or confusion where a number of patients are receiving this treatment, the doses for all patients should fall on the same hour, and as the patients are more quiet just after the hypo-

dermic injection and more wakeful just preceding, the hours above mentioned were selected so that the patient might be sleeping during the serving of dinner and supper and during the hours of morning ward work, and awake during visiting hours from 2 to 4 and 7 to 8 P. M.

The result of this treatment may be studied from the report of 452 cases prepared by my assistant, Dr. Martha Welpton, from the records of patients in the Cook County and Mary Thompson Hospitals during the year 1916.

Under "Sleep" the cases are listed as *slept well*, *fairly well*, or *poor*. The first and second nights are given separately.

"Pain"—anything which might cause patient to complain, as gas, headache, wound, etc.

"Emesis" covers any nausea or vomiting during the first two days, even though it were but a mouthful, and but once.

"Respiration" shows a record of respiration under sixteen during the first twenty-four hours. None was found during the second tweny-four hours.

"Pulse" shows record of pulse above 100 during the first twenty-four hours.

MARY THOMPSON HOSPITAL.

Two hundred consecutive cases operated and given postoperative doses of morphine $\frac{1}{32}$, scopolamine $\frac{1}{200}$, for from twelve to forty-eight hours. Thirty-six hours, or until midnight of the second day, was the usual time.

SLEEP.

	Poor	Fair	Well	Pain	Emesis	Resp.	Pulse
1st night	28	107	65	46	77	62	99
2d night	15	82	101				
Percentage							
1st night	14	53.5	32	23	38.5	31	45.5
2d night	8	41	50.5				

COOK COUNTY HOSPITAL.

Two hundred and fifty-two consecutive cases operated and given postoperative doses of morphine $\frac{1}{32}$, scopolamine $\frac{1}{400}$ for from twelve to forty-eight hours. Thirty-six hours, or until midnight of the second day, was the usual time.

Patients at the County Hospital were given the postoperative dose of scopolamine $\frac{1}{200}$, and morphine $\frac{1}{32}$; but this was soon discontinued and scopolamine, $\frac{1}{400}$, was substituted for the $\frac{1}{200}$ on account of the patient, occasionally, getting out of bed or showing signs of mild delirium, and thereby requiring extra attention from the nurses.

SLEEP.

	Poor	Fair	Well	Pain	Emesis	Resp.	Pulse
1st night.....	40	106	108	33	93	4	136
2d night.....	20	87	145				
Percentage							
1st night.....	15.4	42.6	42.6	13	37	1.5	53.9
2d night.....	7.7	34.5	57.8				

A mistaken idea of the degree of anesthesia or analgesia, that has been produced, can be got by failing to recognize the differences in regional anesthesia.

The following chart gives the relative position of various operations in regard to the production of pain during operation and postoperative pain. Perineorrhaphy and hemorrhoidectomy requiring full doses of scopolamine-morphine, and additional chloroform, or ether heads the list; while extraction of teeth, and operations on the cervix uteri can be done painlessly with so small a dose of scopolamine-morphine that the patient will not lose consciousness.

Analgesia technic must include attention for the relief of gas pains, the relief of thirst, and avoidance of catheterization. Fortunately a simple procedure, namely, the employment of very large enemata to be retained, will perfectly control each one of these symptomatic conditions.

While the patient is on the operating table, and the abdomen is being closed, an enema of 2 quarts of water containing 360 grains of soda-bicarbonate is rapidly (average time two minutes) daministered through a colon tube inserted into the rectum not farther than 3 inches. This 2-quart enema is retained by all patients except hemorrhoidectomies and some thyroidectomies. After the patient has been taken to her room and is comfortable in bed, a time which is approximately twenty minutes after the 2-quart enema was given, another enema of 2 or 3 quarts, with or without the addition of soda, is given, but a little more slowly (average time ten to fifteen minutes). This enema is likewise retained, and is taken up by the circulation and eliminated by the kidneys, skin and lungs.

Pain in the wound itself, which should not be appreciable, is often augmented by the rough handling of the tissues, especially by blunt dissection and by excessive sponging during the operation. The "clean field" method, which calls for constant sponging of the incised parts, not only requires a deeper anesthesia but it exacts a maximum loss of blood by preventing coagulation; it also exposes the cut surfaces to the irritation of the air instead of allowing them the natural protection of oozing blood.

Even the position in which the patient is placed after the operation plays a part in the relief or production of pain. For every pain in the body there is a posture that the patient involuntarily assumes to obtain relief. The characteristic posture to relieve abdominal pain is an approximation of the chest and knees, thus relaxing the abdominal muscles. To secure this posture for the patient who has had an abdominal operation, elevate the upper part of the body with the bed rest or pillows and place a roll under the knees. The universal practice of discarding the pillow as a postanesthetic measure can in no way add to the comfort of the patient, but, on the contrary, may in some cases provoke vomiting or increase discomfort.

Enumeration of the factors in postoperative analgesia technic in order of their importance:

Scopolamine-morphine anesthesia.

Large enemata (4 to 5 quarts) given one-half hour following operation and retained.

Frequent minute doses of scopolamine-morphine at regular intervals after operation, to be continued for the first twenty-four or thirty-six hours.

The use of sharp instruments during the operation, avoiding blunt dissection.

Sponging gently and infrequently.

A comfortable posture for the patient, with a view to secure relaxation, or support, as may be required for the traumatized part of the body.

The fear of operation which so often causes the patient to seek surgical aid too late is a testimonial to the little attention surgeons have assumed toward this subject; it is well worth an effort to impress this upon the profession. By the institution of analgesic technic, the old laborious, worrisome first two days after the operation will be transformed into a much-needed rest and quiet. The hospital will be free from the odor of ether, enemata, and vomitus, the groans of suffering patients, the frequent ringing of bells, and the insistent demands for something to relieve thirst. When

patients are comfortable or sleeping, relatives will willingly refrain from long and frequent visits. Internes will not be wakened at night by nervous and restless sufferers, and the surgeon will have patients who no longer look upon an operation with dread and terror, but who will encourage their friends to take advantage of painless surgery to be restored to health.

Painless convalescence presupposes surgical preparedness, and surgical preparedness, like national preparedness, insures early peace through easy victory.

DISCUSSION.

Dr. Gordon K. Dickinson, Jersey City, New Jersey.—With reference to shock, there was a time when I felt that the anesthesia was 50 per cent. guilty in our postoperative complications, but I have come to the conclusion that the guilty man is the operator. Most surgeons can look back over their work and wonder why it is that 10 or 15 or more per cent. of their patients were shocked. We seldom see shock in our institution, I do not remember having come across a case of shock once a year. A patient can get shock from a dilated stomach.

Two years ago I read a paper on "Pseudoileus," and since then I have had hardly a case. There has been going on an evolution which is the result of careful selection of cases and of good psychology and preparation. I do not think anesthesia has much to do with it and if you are going to blame the anesthetist you will not gain in your fight against shock. A patient should be in the hospital at least forty-eight hours before operation; there should be a smile and a cordial greeting given to such patients. The personality of the doctor and of the nurse, in fact of everybody is a factor to be considered in connection with shock. I agree with Crile that if we can eliminate the psychic element the other factors are only of minor importance.

I saw on the screen the frequent wiping of gauze on the wound. I do not like it. I like far better generalized firm compression with a pack wrung out of water at say a temperature of 120°F., with gentle traction so as not to inflict traumatism. Traumatism to the gut in pulling out the gauze is a bad thing. It develops a type of shock.

Dr. R. E. Farr, Minneapolis, Minnesota (closing the discussion on his part).—The papers are allied and still so diversified that it is difficult to discuss all of them.

The question of scopolamin-morphin has been brought up, and I believe that if we follow the scheme that Dr. Van Hoosen has outlined, but use local anesthesia instead of giving chloroform or ether, these patients will get along much better. A preliminary narcotic in these cases may be a good thing. I have seen so many unfavorable reports regarding the use of scopolamin-morphin that I am somewhat afraid of it and have used it sparingly of late. However, I think scopolamin-morphin has its place in our surgical work.

I have been using a little novocain at the end of the operation, repeating the injection which gives me about two hours additional anesthesia, and many of these patients go on for several hours with great comfort.

One of the essayists brought out the point of the anesthetist examining the patient. As I stated, if we have an anesthetist who can do these things, well and good. However, I prefer to examine my own patients; I find out everything I can about them and would not leave it to the anesthetist. I want to know everything I possibly can about the patient; I am responsible, and the thing that first induced me to use local anesthesia was because I could give it myself. That statement may smack a little of the *ego*, but when I give the anesthetic I depend on no one else. There are some advantages from that standpoint.

The question of time is important only in general anesthesia. In local anesthesia it is not so important. It makes little difference whether you take thirty minutes or seventy minutes under local anesthesia to do an operation. You must get through before the anesthetic is absorbed and its effect has gone. When a patient undergoes an operation under general anesthesia, the reason the length of time is proportionate to the degree of shock is because the patient takes more general anesthesia, and not because you take a longer time in tying a knot or in making your incision.

As to the condition of patients at the end of operation, we have seen the pulse curve and blood pressure curve remain unchanged. I have not my statistics at hand, but we have made these over and over again with patients who have undergone gastrectomy, hysterectomy and other major operations, and aside from cancer cases and operations that have a lot of trauma connected with them, we can send the patients back to bed with a pulse under eighty. We have had several cases return home after an operation with a pulse never above eighty from the time they entered the hospital until they left. We have done and do not hesitate to perform the largest operations under local anesthesia.

The condition of the skin, the color, the pulse, blood pressure and respiration do not change with a perfect local anesthesia, in an operation without trauma.

As to gas pains, I believe postoperative gas pains are directly proportionate to the amount of trauma done to the intestines. Gas pains, eliminating infection, are in almost one hundred per cent. of the cases due to rough handling of the tissues. We do have occasionally a case of hernia where you open the abdomen and the air seems to cause an effect where you do not touch the intestines at all, but other things being equal, gas pains, postoperative temporary ileus, are proportionate to the trauma from the packing in of gauze. I saw in this city, two large rolls of gauze put into the abdomen in a case of salpingitis. The patient came near dying. As soon as the surgeon removed one large piece of gauze there was a letup in the danger symptoms and the patient responded nicely.

Dr. Charles W. Moots, Toledo, Ohio (closing the discussion on

his part).—Just a word with reference to the use of scopolamin and morphin. I reported three years ago that this was a part of our regular routine preoperatively and postoperatively. The fact that we have had no bad results, is largely due to the selection of a carefully made preparation of scopolamin. We do not give it to old people. I scarcely ever give it to a patient above fifty years of age.

When a patient is put back to bed one or two pillows are placed under her head and one or two pillows under her knees to shorten the distance from the symphysis pubis to the ensiform cartilage. This to my mind is the biggest factor in relieving pain in abdominal cases.

The instrument makers have not grasped the idea that it is not necessary to have the feet drop in the Trendelenburg position. The Trendelenburg position is a good thing if you do not drop the feet. In dropping the feet you increase the distance from the ensiform cartilage to the symphysis pubis and render the rectii muscles much more rigid and the pelvis much more difficult to approach.

Dr. Bertha Van Hoosen, Chicago, Illinois (closing).—I would like to say a word in reply to a statement made by Dr. Farr that there was something dangerous about scopolamin-morphin.

I wish to give briefly the experience we have had at the Cook County Hospital. At this hospital we use any preparation that the county can get cheap and sometimes it is one preparation and sometimes another. The scopolamin-morphin is put up in solution in the drug room. We give $\frac{1}{100}$ gr. of scopolamin and $\frac{1}{6}$ gr. of morphin, repeat in an hour, and operate within the next half hour. It is given to patients of all ages. There has been no exception made in the six years I have been connected with that institution. I do not recall a time when we did not have five or six major operations a week, and sometimes up to ten. A nurse gives additional chloroform if necessary. We give one-half chloroform and one-half alcohol. The fumes of the alcohol are stimulating, but most of all it dilutes the chloroform mixture. The nurse is warned never to let the patient's reflexes disappear under any circumstances. If the patient moves she gives chloroform on the mask without any reenforcing with gauze or towels. In all these six years we have never had an occasion to resort to measures for resuscitation; we have never given a dose of strychnia or anything to the patient while on the table. During that time, we have not had a death from it, yet now and then, not once a year, but oftener, a patient will die on the table from ether anesthesia, the safest anesthetic there is.

I want to say a word or two with reference to nitrous oxid analgesia. I think the great relief it gives women during the second stage of labor is wonderful; but my impression is that pain during the second stage is fairly bearable, but that the pain during the first stage is more wearing and ought to be relieved. No one would think of giving gas for hours while the cervix is slowly dilating. Scopolamin-morphin is the only anesthetic that will help out the first stage and all you need to do for the second stage is to continue the injections. The doctor spoke about giving ether when you use

forceps. I have never delivered a woman with forceps under gas anesthesia but I have delivered with forceps many times under scopolamin-morphin anesthesia, and it is the most lady-like job I have ever done. If you apply the forceps without giving the patient any chloroform or ether you simply add your strength to that of the uterine contraction, and it is so easy that you will not be out of breath or change color. When I began I did not know it was so easy to deliver with forceps under scopolamin-morphin, but finally learned it was because I was doing such a small part of the work. I believe it would be the same with gas, that the uterus would work under gas oxygen anesthesia and the doctor would be able to apply forceps much more easily. After having delivered women many times with scopolamin-morphin anesthesia, it happened one day that a patient was brought to the hospital unconscious, in coma, and the baby dead. The woman was taken to the operating room, I put on high forceps, and nobody could understand why I worked so hard to deliver her. I was doing all the work myself.

Dr. Farr.—May I ask you a question? My experience leads me to think that scopolamin-morphin and pain combined frequently results in the patient becoming obstreperous. I have found when using scopolamin-morphin that I had much more difficulty in controlling my patients when I did not have good local anesthesia along with it, and that once in a while some patients would act as if intoxicated. Have you had that experience?

Dr. Van Hoosen.—Once in a while these patients get excitable, but we find some patients who are just as excitable under ether. I think it makes a great deal of difference how we give scopolamin-morphin. If we give scopolamin-morphin in the doses I have mentioned, we have very little excitement on part of the patient unless the patient is in the habit of taking morphin or alcohol. At the Mary Thompson Hospital we make every attempt to individualize in giving the last dose and in that way control the excitability. We give $\frac{1}{100}$ gr. of scopolamin and $\frac{1}{4}$ gr. of morphin in two doses an hour apart to patients ranging in age from fifteen to fifty-five. To patients of seventy or more we give $\frac{1}{100}$ gr. of scopolamin and $\frac{1}{8}$ gr. of morphin an hour apart. The patient is taken to the operating room and if she is excitable, we do not give any more scopolamin, but may repeat the same dose of morphin that was given in the first doses and that does away with the excitability. If instead of the patient being excitable her face is pale and her respiration drops to ten or below, then we may repeat the scopolamin but give no more morphin and this brings the respiration back to normal.

PROPHYLAXIS OF GESTATION.

BY

ASA B. DAVIS, M. D., F. A. C. S.,

New York, N. Y.

GESTATION is as old and inclusive as life itself. Ideas of prophylaxis are hardly less ancient. That which is, has been; what has been, will come again. The devil is wise, not because he is the devil, but because he is old. An ounce of prevention is worth a pound of cure. These are concentrated and crystallized expressions bred from ages of experience.

We listen with grim amusement to the report that, in China, the medical man must keep his patient in good health, or risk decapitation—certainly an urgent incentive to practice preventive medicine. In ancient Egypt the development and knowledge of the healing art reached a very high level. Herodotus reports his personal observations as follows: "Those Egyptians who live in cultivated parts of the country are, of all whom I have seen, the most ingenious. To give some idea of their mode of life: For three days successively in every month they use purges, vomits, and clysters; this they do out of consideration for their health, being persuaded that the diseases of the body are occasioned by the different elements received as food. The art of medicine in Egypt is thus exercised. One physician is confined to one disease; there are a great number, of course, who practice this art; some attend disorders of the eyes; others those of the head; some take care of the teeth, others are conversant with diseases of the bowels; while many attend to the cure of maladies which are less conspicuous." One victorious ruler returned to Egypt and declining to follow the example of his predecessors and build tombs, pyramids, and other lasting structures by which to record the victories and glories of his reign, he converted temples into medical schools and devoted a generous share of his attention and the resources of his realm to the study and advancement of medical science. This branch of learning was held by members of the priesthood. The customs and practices of that time were promulgated with the authority of religious rituals. It is probable that a workable reason for the practices was well understood. Much of the achievement and the reasons why results would follow given practices at that time have been forgotten and lost in the decline and dark ages which followed.

Some of the practices have been handed down from age to age. It is credible that, because of this fact, it was possible for a Scotch surgeon in Uganda, in recent years, to witness and report the performance of a Cesarean section by native operators. It is significant that this operation was done in an orderly manner, and not as an act of native frenzy. The method of preparation is of far greater significance. The report states that the site of operation, the operator's hands, and the instruments were bathed in wine; thus making use of the cleansing detergent and antiseptic value of dilute alcohol; although it is probable that these operators were as innocent of the reasons why they followed this technic, as were our American Indians half a century ago who exposed their store of buffalo meat to the desiccating and bactericidal action of the sun and air, knowing that in this way they could preserve a food supply much reduced in bulk and weight which would keep indefinitely. We are apt to look upon the speculum as of modern invention. Egyptian ruins have yielded up specula which were used at a time too remote for history to reveal the date.

Within the last thirty-five years, Dr. Henry J. Garrigues has written in all seriousness that an outbreak of puerperal sepsis, in a given maternity hospital, was due to the presence of fertilizer upon the lawn. Because of the very high mortality in maternity hospitals his belief was pretty generally shared by medical men and the lay public of that time, that hospitals were not desirable places in which to confine women. We now know that women can be safely confined in an occupied stable, if there is no break in the antiseptic technic and the patient is reasonably prepared.

We owe to wise experimenters, to keen and tireless workers in laboratories, to quarantine, to better hygiene, and to the heroic martyred dead from the ranks of the medical profession, the fact that small-pox, malaria, tuberculosis, diphtheria, yellow fever, typhoid, and typhus, diseases which have cost countless lives, distress, and material loss, are becoming more and more hedged about and, in some instances, almost wiped out, or reduced to sporadic occurr ence Under the initiative and direction of the laboratories of the department of health, large numbers of very young infants in the nurseries of New York are being inoculated with so called toxic antitoxin the idea being to develop and increase the native immunity to diphtheria, so that there shall be a largely increased number of our population who are no longer susceptible to this disease.

We have recently taken a belated and relatively small part in a great war which, by force of circumstances at a critical time, became

a dominating and deciding feature. The effort we have put forth, and the strain under which we have lived, have been enormous. The number of our dead and injured has been very great. Silently, with little warning, epidemic influenza with its accompanying pneumonia spread over a large part of the world. In a few months the mortality from this disease, in this country, outnumbered our casualties from war by more than two to one. In the case of pregnant and parturient women attacked by influenza, the mortality was in the neighborhood of 50 per cent. It is idle to prophesy as to whether or not a similar epidemic of this disease is again to visit us. Its cause is not well understood; therefore, it is not under control, and thus we are no better prepared to cope with its ravages than we were a year ago.

From time immemorial the distress, danger and the frightful loss of life incident to the process of the reproduction of our race, have been proverbial. The annual total loss of life from this cause is staggering. The horrible thought about this is the knowledge that much of this loss of life is unnecessary and preventable.

The accoucheur, developed to his best, should be a well-trained surgeon, because obstetrics is, essentially, a surgical branch of medical science, which has for its field the care of women throughout the whole childbearing process; namely, the treatment of sterility; the supervision and management of pregnancy, labor, and the after-care of mother and child, as well as such treatment and operations as may be found necessary to restore to good health and correct function, which will again enable the patient to take up her accustomed mode of life. It is at once apparent that this is a field of great importance and of very wide scope.

Speaking in a broad sense, the prophylaxis in obstetrics should begin several generations before birth. This places significant obligations upon both parents. A child has the inherent right to be born under favorable conditions; it should be well-nourished, clothed, and sheltered; and, later, suitably educated for the demands of its day and generation.

The progress made in infant feeding and child-welfare must have a direct result, in an obstetrical sense, in that fewer ill-developed and sickly children are growing up. One of the results of the late war will become apparent to obstetricians in a few years hence, when the children of the war zones, who have survived injuries, exposure, starvation, and disease, arrive at the age of reproduction with distorted, ill-developed bodies. The obstetrician should advise as to the care of young girls when menstruation is being established. He

should treat and take good care of cases of sterility. The sterile woman, by the time she becomes aware of her sterility, is usually very eager to bear a child. Often her mental condition is pitiable. She is entitled to a careful search for the causes of her condition and the employment of every possible means to make her a normal woman. This investigation should begin and end with an examination of the husband if he is found to be sterile. If the husband's condition is found to be satisfactory, the physician should inquire into the wife's general health, environment and occupation. A complete and thorough physical examination should be made. Laboratory facilities should be employed wherever they are indicated. If her mode of life is found to be faulty, this should be corrected in so far as it may be possible. Treatment looking toward the cure of any disease found to be present should be instituted. If physical defects are found, such as faulty developments, deformities, stenoses, displacements, and obstructing neoplasms, surgical operation should be resorted to, if by careful selection and skillful technic there is even a reasonable hope of accomplishing the desired results.

The obstetric surgeon must not only meet and manage the conditions incident to normal reproduction, but he must also be prepared to cope with abnormalities and accidents which sometimes complicate gestation, labor, and confinement.

The woman passing through the process of reproduction is no more exempt from disease than the non-pregnant. Not infrequently the obstetrical condition becomes the one of less importance. Critical and dangerous are cardiac decompensation, cardio-nephritis, pulmonary tuberculosis, pneumonia, all acute infectious diseases, chorea, diabetes, cancer in its varied locations, acute appendicitis, tumors and cysts giving rise to acute symptoms with or without twisted pedicles, acute cholecystitis, pyelitis, septicemia, hemorrhage, and shock.

The obstetrician must know how to manage the various forms of abortion, threatened, inevitable, and incomplete; ectopic pregnancies, as well as accidental and concealed hemorrhage. During simple labor, conditions may gradually or suddenly arise which place the lives of both mother and child in jeopardy and operative delivery, either pelvic or abdominal, may be unexpectedly demanded of the attending obstetrician. The uterus may rupture; lacerations, of greater or less extent, may occur in the parturient tract; postpartum hemorrhage, with its accompanying acute anemia and shock, may result. During the puerperium the accoucheur must also be on his

guard for and avert, if possible, complications; he must continue to treat, and, where necessary, operate upon his patient, until she has fnlly recovered. The obstetrician should be the one to perform these operations, because delay would, in many instances, prove fatal to the patient; and, aside from the purely surgical aspect of the case, there still is to be met the strictly obstetrical condition. The two are inseparable. To meet properly all of the demands in the practice of this branch of medicine, the obstetric surgeon must be calm and clear in his judgment and in his actions; he must possess the ability to decide instantly what is to be done, and have a technical operative skill of a very high order.

Prophylaxis of pregnancy (prenatal care) means a supervision of the pregnant woman throughout the whole period of gestation. It means giving instructions as to her mode of life, clothing, occupation, exercise, sleep, diet, hygienic care of her body, and especially the avoidance of constipation. She should be the subject of regular monthly observations during the first six, and bimonthly during the remaining three, months of pregnancy; and as much oftener as the nature of her case may require. At such times her urine should be examined and her blood-pressure taken. Early in pregnancy there should be a thorough physical examination, including careful external and internal pelvimetry. She should be instructed to report promptly anything which may appear to her abnormal, and to bring with her the list of questions which she would like to have answered. The aim should be to prevent, anticipate, and quickly meet complications, if they oocur.

Disturbances of vision should call for prompt ophthalmoscopic examination. Only by this method are we able to distinguish between toxemia of the later months of gestation and the exacerbation of chronic nephritis during pregnancy. In the former, structural changes in the eyes are rarely detected, and the symptoms are transitory if the toxemia is removed. In the latter, structural changes in the eyes are the rule; and, when marked, may demand prompt evacuation of the uterus in order to prevent the loss of sight.

TOXEMIAS OF PREGNANCY.

The toxemias of early pregnancy, as expressed by the term pernicious vomiting, are not as yet susceptible to satisfactory treatment. A considerable number of these patients recover under general care, such as rest in bed, no food or drink by mouth, rectal feeding, hot baths, colonic irrigations, and the tentative and, as the patient improves, the gradual resumption of mouth feeding of solid

carbohydrate food. Transfusion has been followed by prompt and brilliant results in some cases, and has signally failed in others. The results from the use of corpus luteum extract have not been satisfactory in our experience. The improvement, if any, due to interruption of pregnancy appears gradually.

The toxemias of late pregnancy, tending toward or arriving at the eclamptic stage, now admit of early detection and treatment with happy results. We do not encounter so many cases of eclampsia as formerly. Many of those which we do see now are not extremely ill. The mortality is lower. Closer observation during pregnancy (prenatal care), is sending more of these cases in the early stages to hospitals where they are treated with almost uniformly satisfactory results. A steadily rising bloood-pressure warns of toxemia at a considerably earlier stage than the findings in the urinalysis. The treatment is similar to that used in eclampsia. Rest in bed and quiet surroundings are important in conjunction with eliminative treatment, and a diet restricted to milk and cereals, and medication to secure sleep.

RELATIONS BETWEEN PATIENT AND ACCOUCHEUR.

The relations between the accoucheur and patient, in so far as the reproductive process is concerned, should be that of mutual understanding and confidence in order to secure the necessary coöperation. This places obligations upon both persons; upon the former, that he shall be competent, honest, and alert in his interest and well sustained watchfulness, as well as careful and thorough in his investigations of the case; upon the latter, that she shall faithfully follow instructions, report promptly deviations from the normal, give herself over to the entire care of the physician, and place the responsibility for the safe management of her case in him alone. This coöperation should develop in the patient the confidence that all will go well if conditions are normal and, in the presence of abnormalities and complications, the best means will be employed to overcome them successfully. If this relation can be established and maintained, the patient will be immune to the banefu' influences of bearers of horrible tales, which grow in seriousness as they are told, by the donors of gratuitous and irresponsible advice concerning child-bearing. Such talk tends to engender apprehension and unwarranted fear, which is demoralizing to the pregnant woman.

Bad as the record still is, it can be truthfully stated that something over 90 per cent. of pregnant women pass through childbirth with only minor or no complications, and without undue distress and suffering.

Through better obstetrical teaching, more watchfulness during pregnancy, better and simpler asepsis, and better operative interference where operations are necessary, fewer men attempt major surgical interventions in obstetric practice without adequate assistance and surgical training; these and the "let-alone" policy during the puerperium, unless there are decided indications for interference and treatment, have resulted in a marked lowering of mortality and morbidity in the well conducted maternities throughout the country and more especially in the private practices of the more recently trained obstetricians. This improvement has been very noticeable during the past ten years. While there is demand for still greater effort to teach, and to practice, better obstetrics, the betterment obtained furnishes more hope and gratitude.

THERAPEUTIC ABORTION.

There is an increasing number of women, the victims of acutely active, or arrested, pulmonary tuberculosis, who have become pregnant, and who are referred to us with the request that the uterus be emptied and that the patient be sterilized. This practice is susceptible of very great abuse. Some women do not appear mournful over the prospect of being relieved of an existing pregnancy, or over the inability of ever again becoming pregnant. The responsibility for bringing about such a profound change in a woman's life is very grave. On the other hand, we know that nonpregnant women have quite enough to contend with, if they hope to have this disease cured or arrested. Undoubtedly, pregnancy stimulates its progress and makes added demands upon an already overtaxed organism. If abortion is performed, it may need to be repeated at intervals of a few months. We know the results of such treatment in an otherwise healthy woman.

If abortion and sterilization are to be performed, the most satisfactory way to empty the uterus is by abdominal hysterotomy, resecting a portion of the tubes from the uterus, ligating the distal end and suturing the peritoneum over the cut ends. But we need more light and coöperation upon this subject from the tuberculosis specialists. They should be invited to our meetings, and by formal papers and the interchange of experience and discussions upon this subject, we should arrive at a better understanding of what is the right course to be pursued in these cases. The decision to bring about this great change in a woman's life should not rest upon the fiat of a hurried physician who may be working in a dispensary for tuberculosis patients, and who is acquainted with but one side of the question.

PRENATAL CARE.

BY

SYLVESTER J. GOODMAN, M. D., F. A. C. S., PH. G.,

Columbus, Ohio.

I TRUST that you will not be bored by the presentation of a subject which has received such thorough consideration in previous sessions of this body and in the meetings of nearly every medical society in this country during recent years. The very fact that prenatal care has been so persistently and continuously discussed by the profession seems to indicate its great importance to us and to future generations.

Ordinarily, prenatal care begins with conception and ends with the delivery of the child. We should go further, however, and say that prenatal care includes the care of women, from all standpoints, who may expect to conceive in the near future, as well as those who are already pregnant. It will avail little to try to make a woman healthy and happy, after she is enceinte, if we overlook and neglect pathologic conditions at a time when they might have been easily and safely remedied, *before* gestation supervened.

If one were to purchase a piece of real estate, he would likely see that there were no hidden mortgages upon the property. He would obtain a reliable abstract from a good lawyer. Does not this common-sense principle apply to expectant mothers? If one were to plant a garden, the yield of which would mean the future health and happiness of many persons, would he not see to it that seed and soil were in the best possible condition to secure an ample harvest? Does not the same precaution hold true in childbearing women? Until of late, prenatal observation was conspicuous by its absence. "Gestation, in most women of the present day, is not a purely physiologic process. Motherhood exacts a most severe test of women's physical and nervous make-up."

During the past two years, in times of stress and patriotic excitement, we have seen thousands of our women busily employed in the preparation of supplies in anticipation of the needs of the suffering and the dying. But how many of these same women will go to one-half the trouble and expense for the care of an expected child?

Classes were formed for the instruction of women in Red Cross work; but how many of you would take the same pains to teach the pregnant the preparations necessary for anticipated motherhood? And yet more babies were born in this country during the period of war than there were casualties in the entire American Army. The expectant mother is ever in our midst. This fact, perhaps, breeds lack of appreciation.

Schwarz has told us that "more than nine-tenths of the women of the United States receive no prenatal care; that more than 40 per cent. of all confinements are attended by obstetricians who are not qualified to give the parturient woman a full share of the safety and comforts which modern obstetrics makes possible, which ought to be the birthright of every expectant mother and unborn babe."

Reder has told us that "the organism of a woman expecting pregnancy should be in good working order, and any defects which may exist should be corrected *before* she allows herself to become impregnated. This chapter in a woman's life is not dwelt upon with sufficient emphasis, as is evidenced by the ignoring of even the minor ailments which are frequently present."

The average obstetrician thinks it more important to know the technic of applying forceps and of doing Cesarean sections, than to acquaint himself with the simple and homely rules of prenatal hygiene.

Some years ago I was selected to deliver a lecture during "Baby Week" in my city. My subject was "Prenatal Care." Many of the women in the audience were in a "delicate condition," and I have never had a more appreciative audience. A multitude of practical questions were asked, questions that their mothers should have answered. I referred them to their family physicians for the information sought; but the women replied that their doctors were too busy to bother with them; or, if they had already sought information from them, they received but scant attention, or were told to do as they pleased. Physicians generally do not appreciate the great importance of prenatal care, a subject which all ought to understand and appreciate highly.

Obstetric clinics, especially like those of the East, are urgently needed in Ohio, and in many other central and western states. Some of our cities in this country have instituted prenatal clinics and through them the mortality and morbidity of childbirth has been reduced in a marked degree. No doubt the women of any community could be easily and quickly educated to take advantage of such clinics. We have plenty of clinics to care for human wrecks,

but not enough to prevent them. Can one estimate the economic value of the latter?

There are a few things patients should *not* be told when they come for prenatal care. None of the numerous books or monographs commonly given women at this stage of pregnancy are of any value. These books and booklets are, usually, presented for no reason other than to make money for the publisher or to advertise the fad of some extremist. I generally advise patients not to tell their friends about their condition, lest these friends frighten them with bad advice and stories of terrible obstetric calamities, some of which probably never occurred. If my patients desire to use "Mother's Friend," or any other coal oil product to anoint themselves, I offer no objections, because they will do it in spite of injunctions and, aside from soiling their linens, they do little harm. A special diet, in order that the babe may be small, its bones elastic, and the color of its hair fine, does not appeal to me. The idea that, if a woman will remain in bed for the first three months of gestation, she can avert almost any obstetric calamity, is equally foolish, except in certain rare instances.

The pregnant should not attend dancing parties habitually. The reading of good books, playing of the piano, and the wearing of enough clothes to avoid contracting colds should be advised and encouraged. Nor is it necessary for a woman who expects to be confined shortly to clean house, hang curtains and do things which create fatigue and prevent her from being in the best possible condition at the time of labor when her best efforts are needed.

The automobile should be avoided by pregnant women. It should not be used after the sixth month of gestation, except upon smooth roads and at a low rate of speed. Detached placenta and other injuries may occur in women who persist in automobiling contrary to orders. In a way, this caution applies to unnecessary traveling on trains, on the ocean, and on horseback.

A woman should stop, look, and listen before descending stairs. As pregnancy advances, the abdomen enlarges, and she cannot see her feet when standing. The center of gravity is changed, and she becomes more or less awkward in her gait. Accidents are common in consequence and the results, at times, disastrous. What is ordinarily a harmless drug may become a most potent oxytocic during pregnancy. If the woman says that she is afraid to take a certain drug for fear of losing her babe, it should not be given to her secretly. One may be greatly chagrined to find that it does exactly what it was not expected to do.

What, then, is to be done to make the prenatal stage safe and as comfortable as possible? The first complaint is vomiting. For this condition we have no specific remedy. Some remedies have, sometimes, succeeded; all of them have failed. These cases have been treated from the standpoint of the theory of acidosis, the ammonia equivalent, as well as the psychic theory. They have been transfused, bled, starved, and fed. They have been kept in dark rooms under the influence of opiates; they have been subjected to surgical expedients; and all without avail. Recently, I have been administering corpus luteum extract, after Hirst, and I am still where I started. The one best remedy is three months' time.

Headaches should receive careful attention. They may be indicative of grave danger, or they may be relieved by flushing the bowels, or by correcting defective vision, or by any one of a hundred other things not intimately connected with pregnancy. It is possible to glean much valuable information regarding the kidneys, and also certain metabolic disturbances, by an early examination of the fundus of the eye when we are warned by visual symptoms.

The urine should be examined at definite intervals. If albumin is found, it is not, necessarily, a sign of impending eclampsia or uremia. Nor is it always an indication of grave kidney lesion. We may have albumin in the urine if the specimen has not been secured by the catheter. The patient may be on the threshold of a severe attack of eclampsia with the urine normal. The eclampsia toxin, whatever it is, may attack the brain long before it involves the kidney; and nephritis is, many times, secondary to the eclampsia. Eclampsia and uremia are not the same. Albumin in the urine should stimulate careful examination, observation, and supervision of the patient. Its presence in the urine does not mean that the uterus need be emptied, or that alarming symptoms will make their appearance.

My faith in blood-pressure readings is not as great as that of some of my distinguished colleagues. I admit the value of blood-pressure readings in pregnant women; but it matters much who interprets the readings and who weighs the evidence. There has been a common impression that pregnancy causes an increase in blood-pressure; generally speaking, this is not a fact. There may be a gradual normal rise in blood-pressure during the last two months of pregnancy and again a recession during the last week. Campbell says: "There is no question but that, accompanying toxemia, there is in the majority of cases a marked hypertension, and this should put the obstetrician on his guard." Vaquez claims that eclampsia never

occurs in cases of normal tension. Yet we have seen cases of extremely high blood-pressure in pregnancy with no evidence of toxemia; on the other hand, we have seen eclampsia develop and produce death, where the blood-pressure was normal.

The bowels should be kept open and the stool soft. The regulation of diet will do much toward regulating the bowels. The food should be plain and simple. A dogmatic diet does not answer the purpose. Let these patients have food that tastes good to them, and that is intended for human consumption. "Plenty of fruit and little alcohol" is a good rule to follow.

Exercise is of importance. A pregnant woman should be in the open air as much as possible. She need not be forced to sleep upon a *sleeping* porch when the thermometer registers zero. The babe will keep without resorting to cold storage. The patient should go out of doors whenever the weather is agreeable, hot or cold, and when the streets are not slippery. She should walk in the open air every day, dress according to the weather and season of the year, and not extend the exercise beyond endurance.

Clothes should be suspended from the shoulders or hips, or both, whichever the patient may find most comfortable. The ordinary corset need not be laid aside in the early months of pregnancy. She needs it then more than ever. After the third month, the corset must be properly adjusted and productive of comfort. It will aid in preserving the figure of the mother.

The breasts should be treated early. Inverted nipples must be corrected. There is no need to besmear the nipples with disgusting ointments to keep them in condition for nursing. If they are washed daily, and a little alum and cacao butter applied, they will be well prepared for nursing when the time arrives.

Baths are not objectionable. The water, however, must not be too warm nor too cold. The same may be said of the bathroom. Frequent bathing promotes elimination. The moderate vaginal douche, for cleaning purposes, adds to the comfort of the patient.

It is difficult to prevent sexual intercourse during pregnancy. Most obstetricians think we should insist upon it after the sixth month. Accidents are apt to take place from injudicious intercourse about the seventh month. Most women hesitate to seek advice about this matter. We ought to anticipate them in this matter.

Pelvimetry is indicated in every instance. The fact that one or more children have been born *per vias naturales* is no positive assurance that the patient will have no trouble in a subsequent labor, or that the pelvis is normal. Perhaps the previous confinement was

manipulated so skilfully that a partly abnormal pelvis or a large child gave rise to no trouble. Nor is it certain that, because a patient has had a Cesarean section, she will be in need of another. I have delivered several Cesareanized women by the natural route. All women who have previously undergone Cesarean section should thereafter be confined in a good hospital, attended by a competent obstetric surgeon who is ready for any emergency.

Vaginal examination is advisable early in pregnancy. All unnatural discharges, sores, malformations, and malpositions of the uterus should be carefully noted, and their influence upon pregnancy, labor, and confinement earnestly considered.

The teeth should receive attention in all cases. An *X*-ray examination will frequently expose hidden sources of infection, and the removal of the teeth will be most beneficial. Waller's experience has led him to believe that if the removal of dental disease is adequately carried out, even after it has produced symptoms, improvement in health is sufficiently rapid and substantial to be of signal benefit to the child *in utero*. The apprehension of some dentists in regard to cleaning and repairing teeth of the pregnant has no good foundation. I have repeatedly sent women to the dentist to have their teeth put in the best possible condition, only to have the dentist tell them he was afraid that his treatment might cause a miscarriage. There is no more danger in the treatment of the teeth for ordinary defects in the pregnant woman, than there is in manicuring the nails.

If luetic disease be present, no good reason exists why antispecific treatment should be denied the patient. Salvarsan will rarely cause a miscarriage and if it does, no harm is done. Many observers, notably Fullerton, say that "syphilis is, without question, the most common disease met with during pregnancy." Recent military activities will not tend to change this estimate. The frequency of its occurrence is difficult to estimate because of meager statistics. Williams has gathered statistics from 10,000 mothers who came under his observation in Johns Hopkins Hospital and found that 26 per cent. of the fetal deaths were due to syphilis, while the mortality, due to the various toxemias, was only 6.5 per cent. In the face of these statistics it is obvious that prenatal care has a wide field, and that it ought not to be limited to the toxemias.

Williams urges that syphilis be recognized as early as possible for the administration of antisyphilitic treatment. The dosage should be sufficient to be transmitted to the child. Only one-fourth of the syphilitic women present observable lesions during pregnancy; the

remaining three-fourths cannot be determined by ordinary examination. A still-born infant, or living child developing hereditary syphilis, reveals the true condition. Theoretically, every pregnant woman should have an early Wasserman test or better still, before she conceives. Fullerton, like many others, observes that the Wassermann reaction is not reliable in pregnant women. Before, or early in pregnancy, they may give a strongly positive reaction and, without treatment, frequently give a progressively weaker reaction as they approach the end of term; at this time the Wasserman reaction may be negative; and again, within a few months following delivery, the reaction may become strongly positive. Nurses engaged for luetic cases must be warned of the danger.

Skin diseases of all kinds should not be neglected. Varicose veins must be supported by bandages or rubber stockings throughout gestation.

The heart and lungs deserve to be examined at least once during gestation, to prevent the obstetrician's being taken by surprise if unexpected complication arises from these organs. This applies especially to the detection of incipient tuberculosis of the lungs.

A history of mental disease or disturbance in the expectant mother should be carefully considered with a view of preventing or controlling future manifestations.

Rheumatism, or rheumatoid conditions, deserve attention on account of heart and joint complications, and the possible development of chorea.

Tonsils, if infected, should be removed before pregnancy occurs, or soon thereafter. They may be a prolific source of infection. The recent epidemic of influenza has left us with a long train of new conditions related to the sinuses, nervous system, and other parts of the body. It behooves us to take this fact into consideration when examining the pregnant woman.

It is well to attend to hemorrhoids before conception. Hemorrhoids create much discomfort at all stages of pregnancy, especially after delivery; but it is not safe to remove them late in pregnancy.

Goiter may, or may not, be of serious import during pregnancy. I have seen goiters become larger, as well as smaller, during gestation. Some goiters will cause no symptoms, while others cause the patient to become distinctly thyrotoxic. I have had several exciting experiences and one death conducting labors complicated by goiters. It is best to refer these cases to one who has had large experience with all forms of goiters and to follow his advice. Pregnancy is no contraindication to operation if the goiter produces pressure symptoms.

Pregnancy is never a contraindication to surgical treatment of diseases which are, ordinarily, treated by operation. In fact, many conditions which might be treated rather conservatively in the nonpregnant woman become urgently surgical during gestation. In an article on this same subject, Reder says that a woman, when pregnant, is in her happiest sphere when she can be let alone; the state of her sympathetic system demands it. A surgical operation upon a pregnant woman is fraught with danger, uncertainty, and anxious apprehension, not that the operation may prove unsuccessful, but that the pregnancy may be interrupted. We have no guide to help us in our judgment as to the disposition of the uterus to abort in any stage of gestation. It is believed that an urgent major operation, of whatever nature, performed during pregnancy does not influence the progress of the pregnancy other than to favor its continuance, provided no septic process, with its continued high temperature, results in the death of the fetus and causes abortion. High temperature, following infection, usually causes death of the fetus in a few days. The presence of pus is the most formidable pathologic factor. In cases of pus collection, should the pregnancy continue, the consequences of the suppurative process in the pelvis, may result in the formation of adhesions of sufficient strength and extent to complicate seriously an otherwise normal labor.

Appendicitis is a surgical condition which gives us concern during gestation. If symptoms of this disease existed at any time, the appendix ought to have been removed before pregnancy. Some go so far as to demand an exploratory incision where there is a suspicion of the existence of appendicitis. Pregnancy does not predispose to appendicitis, but may light up an old appendical lesion, and change what seemed to be a normal gestation into a serious surgical condition.

Constipation and its attendant unpleasant symptoms, as well as pain and digestive disturbances, give much trouble where a chronic appendicitis has been allowed to remain until pregnancy has taken place. It is a surgical axiom that a troublesome appendix should be removed as soon as it is diagnosticated. Pregnancy is not a contraindication to this edict, but rather a factor making the decision to operate more imperative. The earlier the appendix is removed, the quicker the patient will recover, and the less the liability to adhesions, abortion, and the possible death of mother and child. I have operated upon pregnant women for appendicitis, and have seen many more operated upon by others, but have never known of an abortion or miscarriage, unless pus and continued high temperature were present.

Hernia should be operated upon either before or after pregnancy. The subject of tumors complicating pregnancy would furnish enough material for a separate paper. Some tumors should be removed before conception is allowed to take place; others may be removed during gestation. This is a matter which requires mature judgment. No surgeon should attempt the treatment of tumors complicating pregnancy without the counsel of a competent obstetrician.

Cancer of the cervix, early in pregnancy, is a most discouraging complication; it predisposes to abortion, and its growth is very rapid. Here, too, the mature judgment of an experienced surgeon is of the greatest value. In the more advanced stages of the disease, hysterectomy should be performed without regard to the life of the child. If cancer be discovered toward the end of gestation, it may be well to await delivery and then operate; in the earlier months, the surgeons should insist upon immediate operation.

THE CARE OF THE BOWELS DURING THE PUERPERAL PERIOD; A FURTHER REPORT.

BY

ROSS McPHERSON, M. D., F. A. C. S.,

Attending Surgeon, New York Lying-In Hospital, New York City.

I HAD hoped to present the material with which this short paper deals at the meeting of this Association last year. Being, however, unavoidably detained in New York, I was unable to do so, and I have accordingly carried it forward to this year's meeting in the hope that the subject may have some small interest for you, and that you will discuss it freely.

In order that we may have a clear understanding of the matter in hand, I have taken the liberty to quote from a report (1), made to the Lying-In Hospital in 1917, with which I shall occupy but a moment and thereby give the figures of the first report:

"During the last two decades many changes in both thought and practice have taken place in the care of the puerperal patient, but like the laws of the Medes and Persians, one habit has been fixed; namely, the attributing of a large percentage of all the abnormalities of the puerperium to *constipation*, and as a sequel the administration of various cathartics in regular and large doses.

"Nowhere in medicine does the childlike devotion to custom shine forth with more brilliancy and persistency than in this matter of routine catharsis, when pills and powders are dealt out with a liberal hand to all patients, without giving the hapless individual either the time or the inclination to demonstrate that such catharsis is necessary, the reason being simply that it is the proper thing to do or always has been done?"

In looking over the literature for the past twenty-five years, the writer has not been able to come across a single article treating of the care of the puerperium where the patient's intestinal tract was given any thought, except "of course, the bowels should be opened immediately," or "the bowels should be opened on the second day," "and thereafter kept open by means of a daily dose of . . .," whatever form of physic the individual physician preferred.

It must be admitted that, until very recently, the author was one

of the many who followed the dictates of tradition and prescribed cathartics with schedule-like regularity, to his patients who were in the puerperal period. At times, in fact very often, when a slight temperature appeared and the patient had not had an evacuation of the bowels for twenty-four hours, the administration of the purgative dose did not help matters much, but occasionally it seemed to make them worse. Although this was noted, still so strongly ingrained was the "bowel fetish," if one may use the expression, that no logical action was taken. About two years ago, however, the writer was attending a medical meeting out of town and was conversing with a well-known obstetrician of a neighboring city. The subject of constipation came up; this obstetrician stated that he considered the routine administration of cathartics and purgatives in the puerperium to be pernicious, and that he had given it up in his own practice, believing that many of the low-grade fevers in the puerperium were induced by the *cathartics* rather than by the *constipation*, and this by a stirring up of the colon bacilli and other organisms inhabiting the intestine.

This idea made such an impression that we determined to try it out faithfully in a series of cases at the Lying-In Hospital, and carefully note the results. Accordingly, then, it must be admitted, with a considerable degree of skepticism, each patient was alternately placed in Ward A or Ward B as she came from the delivery-room. The patients in Ward A had no catharsis administered at all, while those in Ward B received the usual routine treatment with the various preparations in ordinary use was given.

In the "noncatharsis" cases three days were allowed to elapse, and if no bowel movement occurred, a low saline enema was given; the patient's bowels then not disturbed until three more days had passed by, when another saline enema was given. This was continued until she was discharged from the hospital.

The results were most interesting. Three hundred and twenty-two patients of each class were carefully observed; of the 322 cases *to whom cathartics were administered*, *twenty-eight* had fever, at some time, during the puerperium, fever being considered present when the patient had two consecutive temperatures of over 100.4 during the puerperal period.

Of the 322 who received *no catharsis*, only *three* had fever, and one of these had a mammary abscess.

The cases were in no way selected. The delivery technic was in all cases the same, and administered by the same operators.

Added to the above statement, let it be said that the number

of women who had a normal bowel movement every second or third day was fairly large; that in none of the cases not receiving cathartics were there foul breaths, headaches, coated tongues, breast complications, or the other time-honored sequelæ which are supposed to occur after a day or two of constipation.

Realizing that the number of cases was not sufficient to be of absolute value from a statistical point of view, the treatment was again begun and kept up until 589 cases in which no catharsis was administered, and 578 cases in which ordinary catharsis was used, were obtained in addition to the original seven, the cases being conducted in exactly the same manner as in the first instance.

In the second series, herein quoted, of the 578 cases to whom catharsis was administered, fifty-six had fever. Figured on the same basis as the others, the proportion of those showing fever was 9.6 per cent. In the 589 cases in whom *no catharsis* was administered, fifty had fever, or 8.6 per cent. Included in ,these were all the foul lochia, acute coryza, a gall-bladder, pyelit is breast cases, and other things to which it was perfectly reasonable to ascribe the fever, so that, while the difference in ratio in the second set was nothing like that of the first, still the cases having the catharsis showed a greater percentage of fever than those who did not.

Taking the total number of cases into account, there were 900 who were given routine catharsis, and 911 in whom no catharsis was administered. In the 900 who had catharsis, there were eighty-four who, at some time or another in their convalescence, developed a temperature of 100.4 twice during twenty-four hours in their puerperium. Of the 911 to whom *no catharsis* was administered, there were fifty-three cases who developed the same temperature at the same time, or 5.8 per cent. In other words, in approximately 1000 cases of each type, the febrile morbidity was about one-half as much in the cases of those who received no stimulation to the bowels as of those who did.

When we consider the lessened danger of infection caused by the spreading about the mother's soft parts of loose diarrheic movements, when we consider the enormous amount of labor saved for the nurses as well as the comfort of the patient, and when we consider the figures quoted in this series, it gives us some intimation of the necessity for active thought on the part of the obstetrician for every move that he makes, every drug that he prescribes, and for less habit and more individualization.

The writer is far from believing that there is never any necessity for administering a cathartic in the puerperium; quite the contrary;

but what he wishes to emphasize is the danger and uselessness of routine drugging, and the assigning of certain effects to conditions which have not been shown to be the cause of the symptoms exhibited.

"Since trying the above treatment in the hospital, the author has adopted it in private practice where the results have been equally satisfactory."

REFERENCE.

1. The Routine Use of Cathartics During the Puerperium. Bull. of the Lying-In Hospital of the City of New York. May, 1917, Vol. xi, No. 2, p. 118.

DISCUSSION.

Dr. Irving W. Potter, Buffalo, New York.—I think we all agree with Dr. Davis pretty thoroughly. There are some points in connection with Dr. Goodman's paper that are very interesting and what he said in regard to the vomiting of pregnancy we all know to be true. There is one point that has come to my attention which is so simple that I presume you will all laugh when I state it, but in the case of a pregnant woman who is vomiting, has been vomiting, or expects to vomit, if you will urge her to chew gum and tell her to continue chewing it, she will get great relief. It aids the secretions all along the intestinal canal and overcomes the various conditions that annoy her.

I am not so sure that Dr. Goodman is absolutely correct in his statement about blood pressure. What he says, of course, is true about the one who interprets the readings, but when a woman starts out with a blood pressure of 120 and it jumps to 150 or 200, something is wrong.

I have been interested in Dr. McPherson's views for the last two or three years. I have followed him very carefully and I think probably he is right. I have been a great advocate of castor oil. The usual dose of castor oil with me is 2 ounces on the second day. There is no homeopathy about that and it generally works, and nobody seems to object to it except the nurse. I am rather inclined to believe that I shall try out the saline idea because I think it is going to save work in the hospital. Possibly it may relieve some patients, but I have always advocated a good generous dose of castor oil, and I use 2 ounces rather than half an ounce because we usually get a more rapid action from such a dose.

Dr. Arthur J. Skeel, Cleveland, Ohio.—With regard to Dr. McPherson's paper, our routine has always been to give an initial cathartic about forty-eight hours postpartum, and after that the patient has been handled with enemas rather than with drugs, not because I have any particular notion it is better for the patient or affects her temperature in any way, but because I think the use of cathartics does diminish the milk supply; and because I felt sometimes cathartics were physicking the baby rather than the mother.

With regard to Dr. Goodman's point on blood pressure, if he means by his statement merely that a rise in blood pressure is not pathognomonic of eclampsia, he is right. In the first place, we cannot define eclampsia; consequently we have no pathognomonic sign of it. Of course, any symptom must be interpreted by a competent man, and I agree with the last speaker, if a woman has a normal blood pressure at the beginning of pregnancy, and that blood pressure goes up markedly in the later months of pregnancy, the fact must be noted. It is true some cases of eclampsia occur without a previous rise of blood pressure, as some occur without previous albuminuria, but that does not alter the fact that if we have albuminuria and a rise in blood pressure immediate attention is necessary.

Dr. Arthur H. Bill, Cleveland, Ohio.—There are one or two points upon which I might comment. In the first place, I have been surprised at the small number of cases of really severe vomiting of pregnancy. I meet with very few cases of what we call pernicious vomiting of pregnancy in my own practice. While I agree with the writers that there is no specific treatment for the vomiting of pregnancy, I believe that there is a large psychic element to be considered. The average pregnant woman, especially if a primipara, is filled with fear and anxiety over her condition. She is worried about what she hears of other women's stories concerning the ordeal of labor and of the complications which may arise. She is nervous over her condition. Assuring the patient after a thorough examination that she is normal, allaying her fears, and gaining her confidence does much toward preventing complications of this sort.

In regard to the blood pressure, I cannot agree with Dr. Goodman, I have come to look upon the blood pressure as one of the best indications of toxemia of pregnancy. Recently I saw a group of cases in which upon repeated examination nothing abnormal could be found in the urine, and still there was an increasing rise in blood pressure in women who had previously had normal blood pressures. I look upon these cases as instances of toxemia and have treated them as such. If such cases are allowed to go on untreated they will eventually, in some instances, become cases of eclampsia. I believe that of all the indications which we have of toxemia, blood pressure is the most valuable and I would trust it more than I would a urinalysis.

Dr. McPherson had told me previously of his practice of treating patients during the puerperium. I have gone through the wards in the New York Lying-In Hospital with him and looked over the temperature charts, have asked the patients how they felt, and I can agree with him that they showed no bad symptoms from lack of catharsis. One of the most disagreeable things to a patient during convalescence is the use of the bed pan. Patients who have been previously perfectly well, who have not been accustomed to be in bed, find this a real difficulty, and especially so if severe cathartics have been given. I have always used routine cathartics and have given liberal doses, not as liberal as Dr. Potter, but liberal doses of castor oil, but I am inclined to think that we would get along just

as well, and with greater comfort to the patient, with less trouble for the nurses, and with less disturbance in the hospital in general, especially in the wards, if this plan were followed.

Altogether I am inclined to agree with what Dr. McPherson has said.

Dr. H. Wellington Yates, Detroit, Michigan.—I desire to emphasize again the point made during the discussion in the matter of blood pressure. I think that is an important phase of this subject. The question of whether a woman has a moderate degree of albuminuria or not is to my mind a very minor feature, but as to whether she has an increasing amount of blood pressure is an important matter. The blood pressure, as the last speaker has said, has been a better guiding star as to the pre-eclamptic period than the urinary examination.

Just before coming to this meeting I had a patient with marked swelling, many psychic symptoms, and a moderate amount of albumen in the urine, that before we studied the question of blood pressure it would have given us a definite idea that she was going to have an eclamptic seizure, but with a former study of her blood pressure, I felt perfectly comfortable about this woman's condition. Her blood pressure was normal all the time; the swelling was extreme; the albumen was very moderate; no eye symptoms; the labia were swollen more than any case that has come under my observation—much larger than my two fists, only permitting an examination with one finger, yet that woman's blood pressure was perfectly normal, that is, 130. She was thirty-two years of age, and I am only speaking of this to give emphasis to what the other three gentlemen have said that the question of blood pressure is extremely important in this condition.

I would like to say something about the care of the nipples. Some fellow of this Society read a timely paper on this subject two years ago. He referred to the prophylactic care of the nipples by the use of sterile oils or cold cream and massage, and depreciated the effect that alum, alcohol and other hardening agents would have. I merely refer to his paper to emphasize the importance of this subject.

Dr. Edward A. Weiss, Pittsburgh, Pennsylvania.—With reference to the occurrence of nausea and vomiting in pregnancy, the thought suggested by Dr. Bill recalls an investigation made a short time ago in a maternity hospital in which there were practically all illegitimate cases. In analysing the histories of patients to ascertain different facts, we also inquired as to the history of vomiting. We found that in 800 cases there was vomiting to a greater or less degree in only 47. We then analyzed 100 cases of our own (private cases), and we found that there were 37, which would indicate that possibly the psychic factor is a large element in the production of vomiting of pregnancy. That is especially true if we remember that the illegitimate cases as a rule have poor hygienic surroundings, and whose general conditions were often bad. In such cases we would expect more toxemia than in those under prenatal care and who were given all the attention required. While it is true that

pernicious vomiting of pregnancy does occur in a certain number of cases, nevertheless it is our belief that it is not as common an occurrence as we have been led to believe in the past.

Dr. Hugo O. Pantzer, Indianapolis, Ind.—The routine treatment advocated by Dr. McPherson meets admirably the average indications, but, possibly, is too little observant of the special conditions pertaining to the individual case. It seems to me we have reason to seek the fundamental causes of the disturbances attending gestation and the puerperium. My thesis for graduation in medicine written thirty-eight years ago, was on puerperal eclampsia. It served to keep me greatly interested in this subject ever since. During this time the efforts of investigators to connect the occurrence of eclampsia with specific outgrowths from the pregnant state have produced various theories, none of which has maintained itself. On the other hand striking observations connecting the disturbances of pregnancy with collateral disease processes have found emphatic expression. Thus, the association of dental disease with pregnancy has found its apt expression in the popular German adage, "A tooth for every child." This, scientifically interpreted, means that when the maternal organism is afflicted with dental disease, the superadded burden of elimination by the toxins of pregnancy, decreases the organic resistance and hereby the disease upon the teeth progresses more destructively. This view connecting eclampsia with toxemia of all kinds is founded on the deteriorating influence that toxemias have upon all glandular organs and accords with the various pathologic findings after fatal cases of eclampsia. Disease changes in the kidneys, liver, pancreas, and the whole list of glandular organs have been reported in such cases. This view necessitates that, in addition to the measures advocated to relieve glandular stagnation and systemic poisoning, we shall search for and treat most energetically *all* foci of infection and toxemia.

One word more about the efficiency of rest. Rest in all infectious diseases effects at least a temporary good, but it does not assuredly lead to the extinction of intrenched infectious microbes. Without such extinction, the effects of the physical strain during child-birth may cause new waves of bacteremia to appear, and set up conflagration giving us puerperal fever.

Dr. Louis Burckhardt, Indianapolis, Ind.—I fully agree with Dr. McPherson and consider his practice wise. Within twenty-four to forty-eight hours after a normal confinement I have all my patients get up on the commode. I have them move around in bed, as there is no reason why we should keep them lying on the back. Mild cathartics or enemas will do the rest.

Whenever we have a case of miscarriage to deal with, we at once ought to consider the outlook for the next pregnancy. Just now are we conducting investigations from that point of view. Eliminate syphilis as the cause of abortion, eliminate infections like gonorrhea, you cannot find any cause. To make blood transfusions, when we have laboratories and hospitals to do the work properly, we make compatibility tests between the donor and recipient. Why then not

make compatibility tests between the donor and recipient in married life. The question opens up a wide subject. The fact is we have found a surprisingly high percentage of cases of incompatibility where we have had repeated miscarriages for which we could not account after all possible and careful examinations had been made. It means, of course, that we made Wassermann's not only once but repeatedly. We take a careful history of the cases, and we rule out vomiting as a cause of miscarriage, and then study the family relationship between husband and wife.

In animal husbandry you know very well if you take an old mare that has never been foaled she will be very resistent to impregnation. We find in human husbandry the old maid who for years is resistent to impregnation. That leads us to the next point. There is a reduced facility of impregnation. Should there not be retarded compatibility. That means young people will quickly conceive, while old ones will take a longer time until physiological compatibility has been established.

Dr. James E. Davis, Detroit, Michigan.—Just a word or two concerning the pathology of catharsis. After a vigorous cathartic has been given, there is produced a hyperemia in the bowel with petechial hemorrhages and ultimate increased activity of the epithelium in its absorptive function. If Dr. Potter could examine the intestinal tract two or three days after giving 2 ounces of castor oil he would find the entire tract studded with punctate or petechial hemorrhages at intervals of about a centimeter apart.

Another feature about active catharsis is that we increase the number of colon bacilli that are deposited about the anal region. We bring to that region colon bacilli that are most virile, those that have been cultured in the upper intestinal tract. This makes it easy to have a cystitis from the colon bacillus.

Last week I had occasion to study diagnostically a case manifesting a high temperature without any definite clinical reasons. After careful examination we found a colon bacillus infection in the bladder. The case showed repeated temperature readings day after day, 102° to 104° F. Daily examination of the urine demonstrated pure cultures of colon bacilli. After stopping catharsis, which this patient had been subjected to for eight or ten days, the temperature subsided entirely without any medication whatsoever other than irrigation of the bladder with 0.5 to 1 per cent. silver nitrate solution.

Dr. James F. Baldwin, Columbus, Ohio.—There is one point I would like to speak of in connection with Dr. Davis' paper, and that is, his advice that the obstetrician should be a surgeon competent to do Cesarean operations. I think this is very unwise. If a man is a surgeon and obstetrician, well and good. If not, a surgeon should be called in case a Cesarean section is necessary.

I know a man of middle age who does nothing but obstetrics; but he has the same opinion of his functions and prerogatives that the doctor gives in his paper. He does Cesarean sections, and at the last report he had a mortality of 33⅓ per cent. That is a horrible

mortality to follow this simple operation. This man has never cut off an arm or a leg, nor has he removed an appendix, and yet he presumes to do Cesarean sections. It is absolutely impossible for a man with this lack of training to do good surgery. In a considerable number of these cases I have had to do a hysterectomy for multiple fibroids in connection with the Cesarean section. A man with an absence of surgical training cannot do a safe hysterectomy under these circumstances or any other. We know there are a very few men with large experience, such as Dr. Davis and Dr. Williams have had, who can safely do this work; but I question very sincerely whether it is wise to let it go out from this association that the ordinary obstetrician should assume to be a surgeon competent to do Cesarean sections, hysterectomies, and work of that sort.

Dr. Asa B. Davis, New York City (closing on his part).—Emphasis appears to have been laid upon blood pressure in this discussion. Until comparatively recently I have not placed a very high value upon blood-pressure findings, but, taken in connection with other symptoms, I have learned more and more to depend upon them. It should not go out from this meeting that blood pressure by itself should indicate a definite source of treatment. We must take into account all of the conditions and symptoms, *and* blood pressure in a given case. However, I do believe that a steadily rising blood pressure where formerly it has been within normal limits, or a sudden rise in blood pressure, is often a much earlier indicator of toxemia than we are able to detect by uranalysis. Blood pressure tests are worthy of employment and careful consideration in pregnancy, especially in the late months. We rarely find a high blood pressure in the early months that is due to pregnancy itself.

Too much stress cannot be laid upon the fact that we should do away with routine, such as the standardizing of patients and treatment, while we are dealing with individuals who are not and cannot be standardized. It is now the popular idea that everything should be standardized in order to gain in efficiency. Carrying this idea too far as to its logical conclusion spells dead level stagnation and the end of progress. We always must take into the account that we are dealing with patients with individual conditions and peculiarities. This must continue until we have arrived at a far clearer idea of the underlying causes of toxemias of pregnancy than is in our possession to-day.

In a former paper I have called attention to Dr. Crile's experiments with indol and skatol, the essence of toxic material fermenting in the intestinal tract. He observed, among other phenomena, that there was increased activity in the suprarenals and that blood pressure was thereby elevated. High blood pressure is almost invariably found in the pronounced cases of toxemia of late pregnancy. As yet, we are unable to state what are the initial causes which express themselves in the symptom complex known as toxemia of pregnancy, but it is my growing belief that it eventually comes down to stasis

somewhere along the intestinal tract, with fermentation and the production of indol and skatol (which, among other things, increase adrenal activity) and other toxic ferments, which are taken up by the portal circulation and probably stimulate endocrine activity all along the line. At autopsy upon patients who have died from toxemia of late pregnancy we always find degeneration of the liver with subcapsular hemorrhages, disintegration of liver cells, and hemorrhages in and about the portal spaces. We also always find edema and hemorrhage of the brain. Other viscera are affected to much less degree. Probably the kidneys are next in order. They sometimes show disintegration of the cells, but more often only acute congestion and parenchymatous nephritis. The liver always shows the greatest destructive changes, because it receives, almost directly from the portal system, blood surcharged with toxic ferments absorbed and undiluted from the intestinal tract.

The pernicious vomiting of pregnancy has been referred to as being largely psychic. The psychic element does undoubtedly enter largely into many cases of vomiting of pregnancy. It is doubtful if it is much of a factor in the truly pernicious vomiting of pregnancy. This is a comparatively rare and a most dangerous manifestation of toxemia. It does not occur above two or three times in a thousand cases. The treatment of this condition taxes our skill and ingenuity. In some cases we are apparently able to check the progress and bring about recovery. In other cases, using all known means, we make no impression upon the progress of toxemia; the patient steadily grows worse and dies.

In the late toxemias or eclamptics, by interrupting pregnancy we are usually assured of results within forty-eight hours. The fatal cases have already occurred within this time. Those who have survived will generally recover.

Interruption of pregnancy in the case of pernicious vomiting either does not check the downward progress—it may accelerate it—or where improvement occurs it is very gradual.

Dr. Sylvester J. Goodman, Columbus, Ohio (closing on his part).—I am not disappointed in that practically no one agrees with me regarding the blood pressure observations. I pointed out that things other than blood pressure, such as microscopical findings, blood count, etc., must be considered. If a woman tells us that she has a pain in her toe, I take an account of it. I want to know why. Just as Dr. Davis has brought out, the blood pressure is of value in connection with the other things.

We have men who decide on the necessity of operation for appendicitis because they have a certain blood count; we have other men who decide that there is danger of eclampsia because a woman has a certain blood pressure. The point I wish to make is that blood pressure is only one factor in the general observation of the patient. Every point in the examination of the patient is of value, but no single symptom must be made paramount and absolutely indicative of certain oncoming complications.

There were one or two other matters I brought up in my paper,

and one of them referred to hemophilia in antepartum care. A woman, a hemophiliac, who had a terrible postpartum hemorrhage at her last confinement, has engaged me to confine her in the near future. She is a known hemophiliac; the laboratory proved it, and we know it to be a fact. If there is any one who can tell me exactly how to deal with that case, I shall be tempted to act on the suggestion.

As to the breasts, I have used alum for toughening the breasts. Immediately before retiring, the patient applies the alum to the nipple. Just before getting into bed cocoa butter is applied on to the nipple. Immediately on awakening, in the morning, she repeats the process. In this manner we secure an elastic, tough nipple.

Dr. McPherson (closing the discussion).—Both the papers of Dr. Davis and Dr. Goodman are of such a character that none of us can fail to agree with practically everything that they have said, and if every one would carry away what they have told us about prenatal care, they would have a great deal less trouble with their patients.

One thing I want to say in connection with what Dr. Davis said and to which Dr. Baldwin referred is this: I do not believe Dr. Davis meant to say, that an obstetrician should not be able to do any surgery except Cesarean section. From my understanding, he said that the obstetrician should be a general surgeon. In that I heartily agree. I think the condition of a woman in labor is absolutely a surgical one. The vagina is a surgical field and one has to have surgical technic in order to take care of such a condition; if a man is not surgically trained, he does not have the technic. It is true, the great majority of cases will be confined by general practitioners. There is no doubt about that, and they will not have as good results as the man who is surgically trained unless they are surgically trained also. A man has no business to call himself a specialist in obstetrics unless he is a surgeon as well.

In regard to blood pressure, I believe Dr. Goodman was misunderstood. After hearing him close the discussion on his paper, I know he attaches a good deal of importance to the value of blood pressure along with other things.

I also agree with Dr. Goodman thoroughly about books for the expectant mother. I object to the obstetrician who gives out printed cards of instructions to his patients. If we take charge of a patient, we have a right to make it a personal matter, and sit down and talk the thing over with her, and give enough time to make her understand what she is to do and what she is not to do, and if she does not understand what we say to her, we can talk to her again at a subsequent visit, and not hand her a card or a book and say, read this or that. We must individualize and not treat all patients alike.

I would like to place a ban to riding in automobiles during the entire duration of pregnancy, although it is very difficult in these days of automobile transportation to keep pregnant women from taking rides in motor cars. Dr. E. P. Davis, of Philadelphia,

brought out the danger at a meeting some years ago, and I have followed his advice ever since. Some of these patients do not mind; they ride just the same if you tell them not to do so. Nevertheless, you have discharged your responsibility in the matter and in this way may save a great deal of trouble.

Regarding the care of the nipples, it has been thoroughly demonstrated that some form of ointment is the only desirable thing to use on the nipples. Alcohol is hygroscopic, tends to macerate the nipple, and makes it worse. What we want is a soft nipple which will not crack in between the tough spots, and since I have been using lanolin I have had far less trouble with fissures and tenderness.

As far as Dr. Pantzer's comments on catharsis go, there are two things I want to say. First, it does not make any particular difference in the series of cases whether the temperature be taken by rectum or by mouth when it comes to figuring out the comparative percentages. As a matter of fact, it reduces itself, and I think Dr. Pantzer so expressed it, to individualism. Nobody in the world believes any more than I do if I have a temperature in a certain case, in ascertaining its cause. When I get a run of cases in the wards where there will be half a dozen running a temperature of from 100.2° or 100.6° down to 99° and then up to 100.4°, that is the type of case about which I was speaking, and such cases do better if you do not purge them in a routine way.

As far as Dr. Burckhardt's statement of getting these patients up early is concerned, I believe that this is the most undesirable procedure in the puerperium that any one can do for a number of reasons which I will not go into at this time, except to say that it was necessary for us to study our cases carefully with regard to the cause of subinvolution, and we found in those cases that got up early we had many more instances of subinvolution, many more flabby abdomens and other complications. I believe it is improper to get patients out of bed until involution is complete.

A METHOD OF PLACING SUTURES IN IMMEDIATE REPAIR OF THE PERINEUM.

BY

WM. D. PORTER, M. D.,

Cincinnati, Ohio.

(With two illustrations.)

In a secondary perineorrhaphy it is often difficult and even puzzling, to determine the original relations of the various structures involved. Immediately after delivery there is no such difficulty, if we except those rare cases in which the lacerated surfaces are very irregular. As a rule, the problem is clearly set forth as soon as the torn surfaces are exposed. It is at once plain just what surfaces must be apposed in order to restore the original condition. It would seem reasonable to expect uniformly good results. But we know that, in a considerable proportion of cases, the results are not satisfactory. Except curettage, secondary perineorrhaphy is the most frequent operation performed on the child-bearing woman.

The reason for the frequent failures in the primary operation is that the torn surfaces are not properly coapted. The suturing is often done without an anesthetic, or, still worse, with the patient partially anesthetized. The light is sometimes poor and often there is no assistant to expose the parts and to keep the surface free from blood and other fluids. These difficulties suggest the importance of having obstetric cases delivered in hospitals. But even in cases in which we have an anesthetist and competent assistants, the condition of the patient may be such that it is desirable to shorten, as much as possible, the period of anesthesia. In view of these handicaps, we are justified in adopting the easiest and simplest method of suturing, provided it gives good results.

The method which I am about to describe requires fewer sutures than the usual methods. I believe, also, that they are more easily introduced, and secure better results. This method is specially suited to cases in which there is a simple longitudinal tear. In irregular tears it may often be employed in the main portion, either before or after suturing the irregular portions.

The method is as follows: The torn surfaces are well separated

FIG. 1.—Showing method of placing sutures in immediate repair of an incomplete perineal tear.

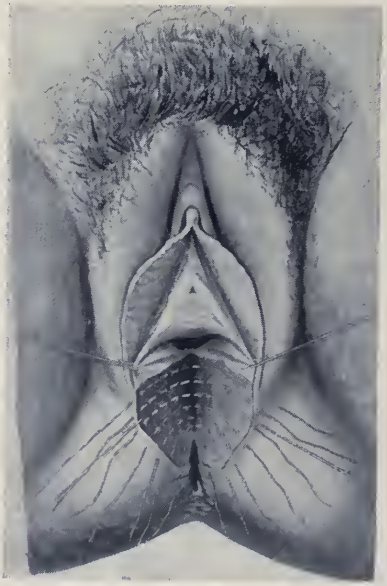


FIG. 2.—Showing method of placing sutures in immediate repair of a complete perineal tear.

so that they form almost a plane surface. The needle, armed with silkworm-gut, is entered at the upper end of the wound a half-inch to the right of the gutter, or deepest portion of the wound, carried down parallel to the gutter, and brought out through the skin at the lower end of the wound. The needle is now removed, placed on the other end of suture, and then carried through the tissues a half inch to the left of gutter. The succeeding sutures are placed parallel to the first with half-inch spaces.

In case of a deep tear, there is no possibility of puncturing the bowel after the first stitch is taken; and the danger is very slight with the first, as the needle moves parallel to the bowel. With the usual method of transverse sutures, the danger may be encountered with each stitch; and the effort to avoid this danger may result in a dead space in the deepest part of the wound.

The patient should, of course, be anesthetized; but, if no anesthetic is used, this method will be found far less painful than the usual procedure. There is, practically, no pain in going through the mucosa and under the torn surface. It is only as the needle passes through the skin that there is pain, but with skilful work the suffering is but momentary. With the usual method of suturing, there is severe pain from the moment the needle enters until it is withdrawn; and the effort to shorten this interval is likely to result in poor work.

If we imagine that the torn surfaces could resume their original positions after the sutures are placed, and before they are tied, we may picture each suture enclosing a narrow rectangle. For instance, if a given suture is carried a distance of 3 inches on each side from the points of entrance to exit, and a half-inch under the torn surfaces, then that suture would include a rectangle three inches long and one inch wide. We know that when a suture is tied it becomes almost an exact circle, provided the tissues are of ordinary mobility. Since the tissues at the lower or external ends of the rectangles are less mobile than those above, it follows that, as the sutures are tied, tissue is pulled down and approximated in such a manner as to reinforce the structures at the site of injury. Or, to put the statement in another way, a comparatively long wound becomes shorter and broader, producing a stronger pelvic floor and perineum.

In case of a complete tear the technic is different, but the principle of pulling down tissue from the lax septum above, is maintained.

If the septum is not torn more than an inch, or an inch and a half, the needle, armed with silkworm-gut, is entered on the left side,

transfixing the end of the divided sphincter; it is then carried up under the torn surface, parallel with and not far from the edge of the torn rectal mucous membrane, until the apex of the tear in the septum is reached. The needle is than carried laterally through the septum between the vaginal and rectal mucous membranes, and down on the right side through the end of the sphincter, to correspond to the opposite side. To complete this circuit with an ordinary needle, it is necessary to bring the needle out and to re-enter at some intermediate point. With a well-tempered perineal needle it is possible to complete the circuit at one sweep. When this suture is tied, it unites the ends of the sphincter and pulls the edge of the septum well down against the sphincter, making an effective closure. It is entirely unnecessary to suture the torn rectal mucous membrane. The succeeding sutures are placed parallel to the first, and it is seldom that more than six are needed. This method gives a union so substantial that the bowels may be moved daily without misgivings.

In case the tear in the septum extends so high that its edge cannot be pulled down to the sphincter, the method must be modified. The tear in the rectal mucous membrane is closed first with a continuous catgut suture. Beginning at the upper end, the injury to the vaginal tissues is repaired down to a point about an inch and a half from the lower end. Then silkworm-gut is used to unite the ends of the sphincter and to pull down the restored septum, as previously described.

In conclusion, I would like to state that these methods have been utilized in my practice for a number of years.

MEDIAN EPISIOTOMY IN PRIMIPAROUS LABORS.

BY

JAMES A. HARRAR, M. D.,

New York City.

It is a continuous marvel not only to the tyro in obstetrics but even as one's experience grows, that a baby is ever born without more serious damage to the lower birth canal. The tissues of the levator ani muscle and of the more superficial urogenital septum are physiologically capable of remarkable stretching, if it occurs slowly, intermittently, and with sufficient surface lubrication. Without proper lubrication not only are the superficial epithelial tissues abraded, but a glacier-like pulling on the deeper structures is produced, rending this union between the layers. Notwithstanding the established efficiency of dilatation in these parts, we are compelled to recognize the fact that the more closely we inspect the birth canal after delivery, the more constantly shall we find more or less damage to the soft tissues. Definite lacerations of the lower birth canal requiring repair, in the experience of the New York Lying-in Hospital, occur in about 44 per cent. of all primiparous labors, and in about 10 per cent. of all multiparous labors.

Undoubtedly in certain primiparæ in whom on careful examination no surface laceration exists, some break in the continuity of the deeper structures may take place; this may involve fascia, muscles, and their attachments. It also must be admitted that a good percentage of primiparæ come through their normal labors with vaginæ that are intact for all functional and mechanical purposes.

Would a neater end-result be obtained in the latter cases by doing an episiotomy before they were stretched to their full capacity? In the ones that do tear, would a better union with less scar tissue be assured by episiotomy? There is much conflict of opinion on the entire subject. Good authorities claim that it is not possible to foretell a laceration and that lacerations heal as readily, and are as easily repaired, as an incision. Equally good authorities, with perhaps sounder surgical grounds, maintain the opposite. There is also some difference of view as to whether the incision should be in the median raphe or placed laterally.

Some operators, in their eagerness to avoid a tear, consider that as

long as the fetal heart remains of good quality an indefinite time can be allowed for the termination of the second stage. I am a firm believer in taking things slowly, to avoid laceration of the soft parts, as long as an appreciable advance of the presenting part continues. But the welfare of the baby must constantly be kept in mind. The head cannot be permitted to pound ineffectually on a too resistant vulvar barrier. Every now and then a baby comes to autopsy with a large cerebral hemorrhage, or the small punctate hemorrhages of asphyxia in the brain, liver, and other organs generally, in mute evidence of too long delay in the latter part of the second stage. We should not, to use a sporting phrase, play the baby's heart against the perineum. The odds are not even, or proper. In many such instances, a properly timed episiotomy would have saved a baby's life. Laceration or incision, and the head, that may have been delayed on the perineum for over an hour despite good contractions, slips through with the next pain. Episiotomy thus not infrequently will obviate the indication for the low forceps operation.

There is no question as to the difficulty in deciding when a laceration is inevitable; and, unfortunately, judgment here does not always come with experience. Other things being equal, however, and granting the absence of such conditions as a narrow pubic arch, disproportion of the presenting part and passage, edema, or inflammatory conditions of the vulva, all of which usually presage a tear of the perineum, a sign that has been of real assistance to the writer is the inclination of the vulva as bulging begins. The more nearly vertical the vulva is as it begins to gape, when the woman is lying on her back, the less a perineal laceration is to be feared. But when the perineum shows pronounced distention near the anus, and the anus dilates early, while the tissues about the vulva lie flat, laceration is likely to occur. The glistening appearance of the perineum stretched to the utmost, described by the text-books, also is never to be disregarded.

It is somewhat of a contradiction of terms to say that the obstetrician avoids a laceration by doing an episiotomy. Nor should we argue that we avoid a deep laceration by making a superficial cut. The serious subsurface lacerations of the levator ani and those of the vaginal wall running up to the fornix, of course, will not be prevented by an inch-long episiotomy of the fourchette, whether performed early or late. The more extensive vaginal lacerations usually occur during forceps operation, craniotomy, or a rough breech extraction. Before we approach any of these, in my opinion, we

should make a careful, prolonged, and thorough manual dilatation of the levator, remembering that it is important to dilate gradually, intermittently, and with liberal lubrication. Green soap is the best for this purpose. In certain cases, on account of a narrow, bony outlet, great rigidity of the soft parts, disproportion or emergency, it may be advisable to make deep vaginal wall incisions in the levator ani, going up in one or both of the vaginal sulci. This incision should be preceded by a median incision of the raphe, going down to the sphincter ani, then swerving to one side and continuing up the lateral sulcus in the manner about to be described.

The median incision of the raphe anterior to the sphincter cuts chiefly the central points of insertion of the superficial group of muscles constituting the urogenital septum. Of the levator ani, it cuts only the so-called Lushka fibers, those few fibers running across between the sphincter ani and vagina. I have used both the lateral and the median incisions in the perineum, and it has been my experience that a better union is obtained with less rugged scar tissue and with better preservation of function, with the median incision than by severing laterally the transversus perineii and bulbocavernosi muscles across the continuity of their chief muscular portions. What we gain by episiotomy is this: if laceration of the perineum impends, we avoid a jagged or transverse splitting, or butterfly tear, by making a single straight clean-cut incision. We turn the lower end of the incision away from the anus and avoid injury to the sphincter ani. If the vulva is holding the head on the perineum, despite good pains, a properly timed episiotomy will prevent serious asphyxia of the child from prolonged pressure on the head with its attendant cerebral hemorrhage.

The simple median episiotomy is employed only during the perineal stage of labor. Use ordinary light blunt-pointed cervical scissors curved on the flat. Place the forefinger in the vagina during a pain. About half an inch inside the distended margin of the perineum will be felt a tense band, corresponding to about the location of the hymenal ring. With the middle finger and thumb press the anus to one side and introduce the scissors with the curve pointing in the opposite direction. Start the incision in the midline severing the tissues of the urogenital septum in the median raphe for about three-quarters of an inch. It is desirable to have the incision extend farther on the vaginal, than on the skin surface of the perineum. As the scissors close, the incision will curve slightly away from the anus. This swerve at the lower end of the incision will meet the chief objection to median episiotomy of the lateral incision enthusiasts, who

have much to say on the danger of the median cut extending into the sphincter ani. If more room is required, or if the levator ani is not well dilated, and it is necessary to make an emergency delivery notwithstanding, continue the incision, vaginally, in the line of what will be the vaginal sulcus aside of the rectum. The incision is best made with successive snips rather than with one bold cut.

The repair can be made satisfactorily with a few buried sutures of twenty-day chromic gut, and the margins of the wound may be brought together with interrupted or continuous subcuticular sutures of the same material. Except in the smallest incisions, it is best to do the repair after the completion of the third stage.

By careful observation episiotomy will be found to be of avail in about one-third of all primiparæ. I have never regretted the procedure in any case in which I felt the necessity of doing it.

There is nothing very new in this operation. Michaelis wrote about it in the eighteenth century, recommending a median incision in the raphe, and calling it episiotomy. Of recent years Anspach of Philadelphia and Pomeroy of Brooklyn, have advocated its extensive use, and the effort of this present discussion is to emphasize it as a simple and resourceful help in delivery, to be more frequently used in delay in the perineal stage of labor.

DISCUSSION ON THE PAPERS OF DRS. PORTER AND HARRAR.

Dr. J. Henry Carstens, Detroit, Michigan.—The last paper shows us that there is no need for the first paper. If you do an episiotomy and have no rupture of the perineum, what is the use of doing the other? I think there is less danger from infection from the anus and the wound will certainly heal just as well.

As far as the first paper is concerned, I have listened probably to some sixty on the subject of the correct way of placing the sutures in operating for torn perineum, and the authors finally hedge and say that sometimes there are variations, and then you must place the sutures somewhere else and put them in differently just as Dr. Porter did. What is the final outcome of it? In my judgment there is *no one* correct way of placing sutures and sewing the perineum. You can do it anyway that you please. I do it now, not with one of these large big needles that you put in on one side and pull out on the other. That is a good way to produce tetanus. I use a small needle and bring the tissues together as accurately as I can, not too tight and bring all the muscles together. If you need a stitch or two in the skin of silkworm gut, you can put them in extra, and thus hold it together.

Dr. Edward J. Ill, Newark, New Jersey.—I cannot see how Dr. Porter is going to bring the tissues together if he parallels his sutures. Sutures put in that way will purse string the tissues. The way it

should be done is to give the suture material a wide sweep. The farther you go out the safer you are, thus bringing the tissues together you will approximate broad surfaces. I have studied this subject for over thirty years, and I have had eighty-six complete lacerations sewed up without a single failure. When this Association met in Newark two years ago I showed the operation then. We often forget that the sphincter muscles are surrounded by fascia; that all these fascias and muscles are inserted into the vagina and skin, and unless you go within that sphincter with the first suture and bring the inner end of the sphincter together you have a good reason for failure. To be sure, if nothing happens to the wound I would sew up a fresh tear as well as an old tear. I would sew up the rectum first, most carefully casting aside any instrument, suture or ligature which touched the mucous membrane and thus becoming infected. The moment forceps, suture or needle touches the mucous membrane of the rectum or the skin it must be discarded. When you once have the rectum walled off the rest is easy. But the main thing I want to speak of is not to pull these tissues together like a purse string.

Dr. Albert Goldspohn, Chicago, Illinois.—I am sorry that I must disagree with Dr. Porter in principle and on anatomical grounds. The circuitous stitches which he places begin on the skin, go way up over the internal angle of the wound and come out on the other side upon the skin, and are tied on the skin. This method of suturing converts the longitudinal wound into a round one by unnatural purse-string sutures. This is as unsurgical as it would be to close even a small abdominal incision by purse-string sutures. The torn parts are jumbled together but are not brought into individual coaptation as needed for real repair. Aside from the superficial soft parts, these tears usually injure the more resistant facial urogenital diaphragm (triangular ligament) and the levator structures beyond. These important bearing structures in the perineum should be given the best possible chance for individual reunion; and this can be done only by purely transverse and buried suturing. I have always criticized practitioners when they followed the essayist's type of suturing a fresh laceration of the perineum, for the reasons mentioned; and furthermore, because such purse string and also figure-of-eight sutures tied on the skin, shorten the posterior vaginal wall; and this is wrong because it acts in a direction opposed to normal anteversion of the uterus.

Inasmuch as good exposure and the most nearly exact reunion of the parts in the upper angle of the fresh tear in the vagina by buried suturing is aided much by lateral retraction of the outer parts of the wound, it is advisable to suture that inner portion of the wound first also in cases of complete tear, with a constant current of water running down over the tear in the rectum, to make it innocuous to the sutures used. After this has been done, sew up the tear in the rectum and the sphincter next with great care, as Dr. Ill has said, to keep the sutures from contact with the mucosa of the bowel. When this suturing of the bowel wall with catgut has been

done, it is well to pass a tension suture of silkworm gut as a loop within the rectovaginal septum around the buried suturing of the bowel wall, and to tie it before finishing the so-called perineal body. By this suture the little fistula will be prevented which otherwise is apt to remain just above the united sphincter ani.

Dr. John Norval Bell, Detroit, Michigan.—I should like to amplify Dr. Goldspohn's remarks relative to the operation of Dr. Porter being anatomically incorrect. I think I can best illustrate what I have to say by referring to Dr. Harrar's charts. Dr. Porter puts a stitch under the vaginal wall and brings it down so as to pucker up the levator ani muscle, and leaves a space here through which parts can herniate. We all know that if we shorten the posterior wall we naturally pull upon the vaginal wall where it is attached to the posterior surface of the uterus, and in that way tend to produce retroversion of the uterus during the puerperium.

Dr. Arthur J. Skeel, Cleveland, Ohio. Practically none of the fibers of the levator ani come anteriorly to the rectum except Luschka's fibers which do. They are very few in number and nobody can find them in operating. I am impressed with one thing and that is, all operations that are designed to restore the anatomical structure as they were before labor fail absolutely to do it. The levator passes from the white line downwards to the side of the rectum and behind it. In the operation usually done we aim to unite the transverse muscles and facia of the perineum. In a median tear the muscles run this way and the levator ani fibers run this way (indicating). If we are not afraid of burying our sutures attached to the muscles this way, we can bring them together. All operations devised for restoring the perineum enable you to do what you do in a hernia, they put the muscle fibers where they do not belong but cure the condition. The ends of the anterior levator fibers unite with the anus and rectum. The tiny fibers running in front you can hardly find in the dissecting room. If we are clean in our work, as Dr. Carstens has said, and use a small needle and unite the transverse layers of the perineum we will restore the structures there. There is no procedure yet devised that restores the levator ani fibers to the condition in which they were before.

With regard to uniting a complete tear, if you catch the tissues in this way (indicating) and bring the mucosa together and unite it just as you do a subcuticular stitch without having the stitches go through the mucosa at all, there is no infection to interfere with union.

Dr. Henry Thomas Sutton, Zanesville, Ohio (by invitation).—I desire to call attention to the time when to repair the perineum. I have been doing obstetrical work for a great many years, and it has only been in the last few years that I have discovered repairing the perineum immediately after tying the cord, and before the placenta is delivered, is the simplest and easiest thing in the world. The wound opens right up; you do not need assistance, you need not bull the patient across the bed; you simply spread her knees apart and there is marked bulging of the wound. After the placenta has

been delivered, all the parts contract promptly and with all the assistance you get around it has been difficult for me to do a satisfactory perineorrhaphy after the placenta has been delivered. It has not been referred to today, and I have never heard or seen it referred to. Every time I do it now I think of how I used to struggle and worry trying to get a good view, especially at night when the light is not good. You will have almost no pain; the anesthetic that has been administered in the last stage of labor will be quite sufficient. In slight tears you will not need to give any more anesthetic, and only since I have been doing repair before the placenta is delivered has my work been at all satisfactory, and I hope that the gentlemen in closing the discussion on their papers will refer to it. I think it is seldom that it is necessary to cut the parts. If you are watching your case closely, dilating, helping to stretch the parts as the head comes down, you will be able in most instances to deliver without dividing the tissues. Frequently the head is gotten through without much of a tear, and I then congratulate myself I have not unnecessarily mutilated the cases. Like Dr. Carstens, I do not use a large needle any more but a small one, and with the placenta undelivered it is easy to do repair. You do not need to be told how to put the stitches, the manner will suggest itself right there, and particularly the manner of bringing the muscles and fascia together that the doctor has just referred to.

Dr. Francis Reder, St. Louis, Missouri.—Dr. Harrar has reminded us that there is still an operation known as episiotomy. This operation dates as far back as 1742, when it was suggested by Ould. Not until 1885 did this helpful measure receive due attention. At that time Credê and Manton became its advocates. During Ould's time anesthetics were unknown. Evidently something had to be done to relieve the pain caused by the muscular rigidity at the inferior strait and this operation was devised. Dr. Harrar tells us to make it in the median line. Here he differs from the old authorities. He has given us convincing reasons in doing so. The middle of the perineum is the toughest part of the perineum. It seems that nature has taken this precaution to protect the rectum from injury. Episiotomy, lateral or median, like all operations in gynecology, has a definite place. If you meet with a head which is unusual in size, or encounter a difficult face presentation, or a rigid perineum or a short perineum, and if you are going to do something to minimize a perineal tear, an episiotomy will help out.

The difficulty in understanding the perineal operation as presented by Dr. Porter and by those who have taken part in the discussion is the difference between the primary and secondary perineorrhaphy. I have delivered many women after Dr. Porter has done the operation he has described, and I have always found the pelvic floor in admirable condition. What we want is a perineum that fulfills the function of former days. It is a very common thing to have a woman come to us suffering every time she has sexual intercourse because nature has not been imitated. The parts have not been restored as an elastic, small, perineal body, but there is a perineal body about

three times as big as nature made it, and the operator thinks it is an improvement.

So far as stitches going through the rectovaginal septum are concerned, there is a tendency of the rectal contents to work through between them causing a fecal fistula. After a complete laceration is repaired, as Dr. Porter has described it to you, there will be no danger of fistula because you have successive sutures one upon the other parallel to the bowel, guarding against the possibility of material passing through. As long as the sutures go through the rectovaginal septum, you have spaces intervening which invite the rectal contents to go through.

So far as shortening the vagina is concerned, the posterior vaginal wall is long enough after delivery. Pulling it down temporarily to fill the space does not mean you have shortened permanently the posterior vaginal wall. That criticism has no standing in court.

As to the paper on episiotomy, it seems as though the author had actually studied the cases at the bedside. If you have a perineum that is growing longer and longer with distention, the thing to do is to split it square down in the middle and you do not have to go off to the side. That is the only criticism I have to make. You do prevent these deeper lacerations by this act. Why? The indications of danger to the pelvic floor are these: small vulva, gradually looking upward before the advancing head. What is happening? The pelvic floor is being pushed down and the posterior vaginal wall cannot follow it. You can always demonstrate before there is any danger of tear externally splitting of the mucous membrane in one sulcus or in both. Whenever there is a splitting of the mucous membrane in one sulcus or both, that is the time to split the perineum. After the perineum has been lengthened, by making a cut to enlarge the vulva you prevent further distention. This procedure will prevent these deeper lacerations of the pelvic structure which cannot be found at the time. The fact that the perineum did not tear is no indication that this woman has not been practically ruined physically, because after the vulva has been distended without laceration, the great stretching may have separated the deeper structures which cannot be detected, but which will result in ultimate prolapse. If you have a perineum that is stretching entirely in its lateral diameter, expect complete laceration. In that case it is cut on the side, but you will get very little help. I cut both sides rather than have a tear into the sphincter. I never cut to the side when I have space to cut in the median line. The center is the strongest part. One gentleman says, is that the reason laceration occurs in the midline? When you approximate identical surfaces, they come together perfectly and unite perfectly.

I have had unusual opportunity to observe Dr. Porter's work. I have seen him do the operation he has described; I have taken care of his patients afterward, and I can truthfully say to you that this is a method that works.

Dr. Ross McPherson, New York City.—In regard to the perineum, it seems to me that I get more lacerations of the perineum

than anybody I know of, although I have pretty good results from the repair. I follow these cases for a long time. There is a good deal in what Dr. Carstens has said. I come to this and other meetings and I get a new operation every time I come. I try it and it does not work any better than others. The whole proposition is to restore the parts as they were formerly, or as they were torn, and if you put mucous membrane to mucous membrane and fascia to fascia and muscle to muscle, it makes very little difference, if you know how to put the sutures in.

Dr. Harrar's paper on episiotomy was very interesting. I have seen a good deal of this work, and I think in its place episiotomy is the best thing that has ever been done in obstetrics. Anyone who can always predict just when he is going to have a laceration of the perineum, where it is going to be, how extensive it is, and what the result to the patient is going to be after he has sewed up the laceration, does not need to do episiotomy. But I cannot. I do not know what kind of laceration I am going to get when I am applying forceps. I do not know whether the tear is going to be in one direction or another, or whether I am going to lacerate a large portion of the vaginal canal. On the other hand, I do know that if I make a proper median episiotomy, I shall have a clean edged wound, and when the operation is over the parts come together in good apposition. You can see the layers, fascia, muscle, mucous membrane and skin, and they heal nicely. When a patient gets through with the puerperium we cannot tell whether she has had a laceration or not, neither from the size of the perineal body, the scar, nor the position of the uterus. I am a strong advocate of this operation in cases where there is no question whatever of our getting a laceration. I do not like the lateral operation because in my hands the incision does not heal as well as the median incision.

Dr. Porter (closing on his part).—I thought I made myself very plain in starting out by stating what was necessary to get a good result in a primary operation. I made no effort to discredit other operations; I simply advocated the operation I have described because it is simpler and easier. A number of the objections raised hardly apply to this method.

Dr. Goldspohn criticizes me and speaks of bringing down all tissues from above, and says that if he closed the abdominal wall with longitudinal sutures, he would have a similar condition. It is not so at all. In the abdominal wall you have continuous and identical structures. You have the same structures at the lower end of the incision as at the upper end. It makes no functional difference if you pull the septum down. The patients would often be better if the posterior wall were shortened after labor. The damage is not limited to transverse structures. Often a great strain is thrown upon the longitudinal structures which are stretched until the posterior wall is lengthened, sometimes several inches. What is the objection to shortening it by the fraction of an inch? The objection, it seems to me, will not hold.

Those of you who have seen Joseph Price close the abdominal

wound in the older days know that he got just as good results with through-and-through sutures as you get now by bringing individual structures together, because the sutures were put in accurately. The suture went through the skin very lightly, caught the tendons and muscles deeply, and came through the peritoneum very lightly. When you close the wound the structures come together accurately, the only exception being in case of fat abdominal walls. There tier sutures are better. In the ordinary case there is no advantage. I watched these cases in my early days very closely, and the percentage of hernias was no greater than it is now. That statement will be confirmed by many of the older men in this room.

Dr. Ill mentioned an objection, but when the suture is tied it does not take any such shape as he told us. You look at the silkworm-gut sutures when you take them out. If you take them out carefully they resume their circular shape. It is entirely a matter of mechanics.

Dr. HARRAR (closing the discussion).—It is the object of my paper to call attention to the fact that lacerations occur in about 44 per cent. of all primiparæ (that has been our experience, and I think we are as careful as any) and a greater effort should be made to control and repair these lacerations at the time. If the general practitioner will more frequently have resort to episiotomy, the gynecologist will have less to do later.

REPAIR OF PARTIAL AND COMPLETE LACERATIONS OF THE PERINEUM.

BY

A. GOLDSPOHN, M. S., M. D., F. A. C. S.

(With thirteen illustrations.)

THE writer has made use of the operation, herein described, for twenty-five years. Under the heading "Intrapelvic and infravaginal perineorrhaphy without loss of tissue," he described the technic briefly in 1897;(1) and more in detail, with illustrations, 1901.(2) Inasmuch as the citation of the literature and of the meritorious contributors on this subject who preceded him was made at that time and again in 1914,(3) he will omit reference to it now, and deal only with the practical and important features of this subject.

The profession is pretty well agreed that all former standard operations of this kind were merely vaginal resections of variable depth and extent, without restoration or improvement of the real bearing structures beneath them. Mistaken conceptions of the anatomy of the female perineum have caused errors in the technic of operations for lacerations of it, and these mistakes have not yet been fully avoided. That a reunion of the bilateral, backward-extending portions of the levator ani muscle and its fasciæ, near the median line, between the rectum and the vagina, is the chief desideratum, is generally admitted and striven for; but about the exact location and the accessibility of the levator ani muscle, there is still much difference of opinion; and, frequently, more superficial structures are mistaken for it. Because the levator ani lies, normally, in a bilaterally receded position within the pelvis, behind the narrower introitus, it will not of itself come out toward the median line, into plain view within the lumen of the wound, in any dissection. It will appear so only after it has been drawn to the median line and is held there. Therefore, all who represent it as lying there naturally or voluntarily, are mistaking other structures for it—probably the narrower and firmer urogenital diaphragm, the trigone, or triangular ligament, that will thus appear in the wound or dissection.

The pubo-rectal and pubo-coccygeal portions of the levator ani in its fasciæ—the parts in which we are interested—can be felt plainly

with a finger in the vagina of a nulliparous woman, when it is passed with moderate pressure over its lateral walls. Close under the symphysis pubis these levator parts lie, indeed, quite near or upon the trigone, triangular ligament; but they extend downward and *backward* from there, so that, when they reach the level of the rectum, they are 5 to 6 cm. inward from the plane of the hymen; and not merely "half an inch or less," as is stated by Sturmdorf(4) and by

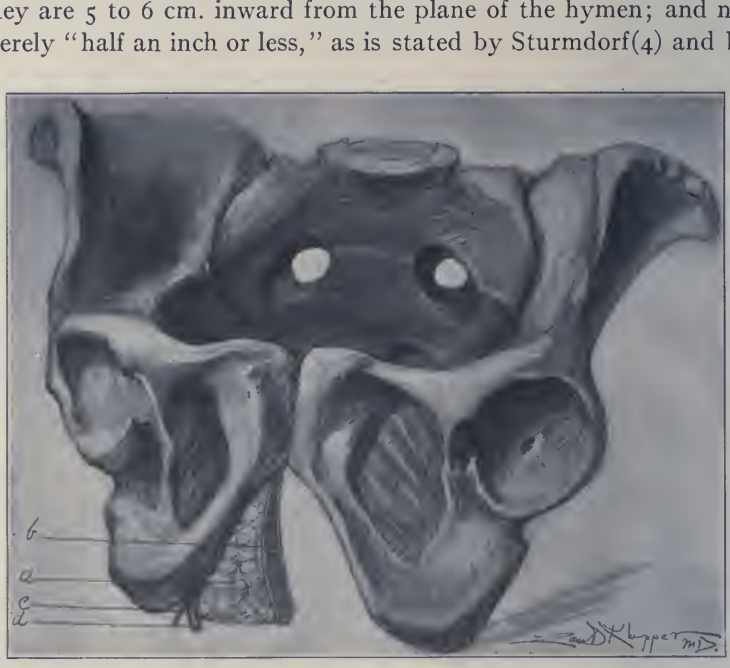


FIG. 1.—A drawing of a manikin, constructed after illustrations by Gray and by Liepmann. A cross section of the ischiorectal fossa (*a*) and of the levator ani muscle with its fasciæ (*b*), is represented The internal pudic artery (*d*) guarded by the obturator fascia (*c*), lies upon the outer side of the ischiorectal fossa, at a safe distance.

Jellett,(2) and as is inferred from the technic of a number of other authors. And it is closely upon the rectum that the union of the levator parts must be made, to construct a bridge 5 to 6 cm. wide, directly over the bowel, to hold it down properly, and not merely to form a bar across the introitus internally. Operating at a depth less than 5 to 6 cm. inward from the hymen, can, therefore, not usually fulfill the correct anatomical requirements.

The anatomy of the female perineum becomes clearer when grossly divided into three strata, as is done by several French and German anatomists, the *first* embracing the subcutaneous tissues and superficial muscles, the bulbo-cavernosus, ischio-cavernosus and superficial transversus perinei. The *second* layer is called by several

anatomists the urogenital diaphragm, or trigone. By others it is erroneously called the triangular ligament, a name that suggests nothing of its composite structure consisting of two layers of fascia with a muscle, transversus perinei profundus, between them. This dense, strong, and more inelastic formation fills in the angle formed

FIG. 2.—(Plate XII of Edward Martin's Atlas.) Labia, skin, subcutaneous fat, superficial perineal fascia, and contents of the ischiorectal fossæ are removed. The ischiocavernosus (*a*) bulbocavernosus (*b*) and superficial transversus peronei muscles (*c*) (belonging to the superficial stratum) are intact on the left side; but the latter two muscles are cut away (*d*) on the right side to expose the urogenital diaphragm (*e*) (the middle stratum) on that side The bulbi (*f*), Bartholin gland (*k*), vulva (*g*), and the anus (*h*), with the external sphincter (*i*) are intact. The levator ani muscle (*i*) constituting the innermost stratum, is divested of its outer fascia.

by the descending pubic and ascending ischial rami, back to the anterior border of the anus. It closely surrounds the vaginal introitus near the hymen, and forms a firmer and narrower boundary around that passage than the levator ani does. Its inner borders are more easily exposed and made to stand out plainly. The *third*

layer is made up of the levator ani muscle, which is lined on its upper or visceral side by the rectovesical fascia and covered by the ischio-rectal or anal fascia on its under or outer surface. These fasciæ are as important to be engaged for service as the muscle itself, here as well as elsewhere in the abdominal parieties, where con-

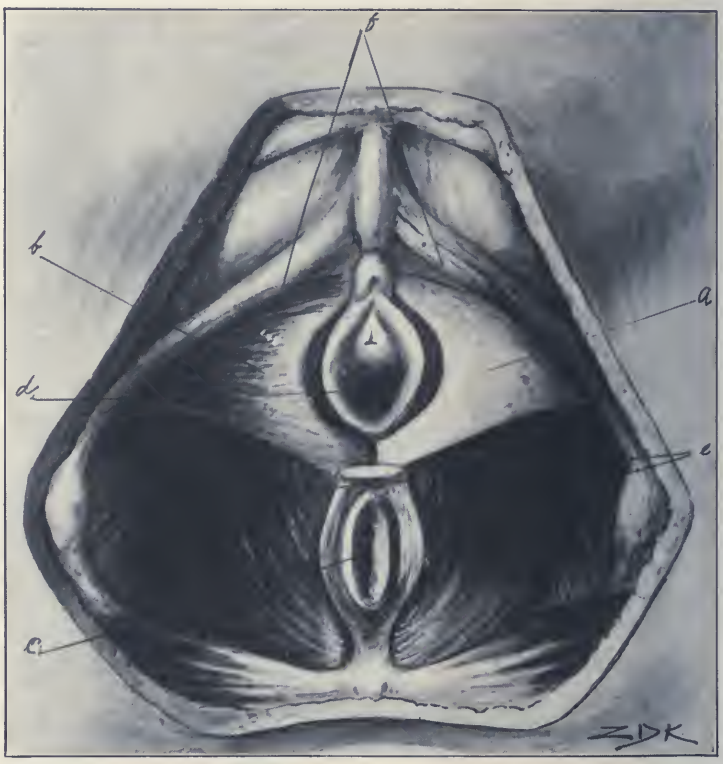


FIG. 3.—(Martin Plate XIII.) All the muscles of the outer stratum and the bulbi have been removed. The urogenital diaphragm (the middle stratum) composed of two layers of fascia with muscle between them, is intact on the left side (*a*), but its outer aponeurotic layer, has been removed on the right side, to show the fibres of the transversus peronei profundus muscle (*b*) within. The anus (*c*), the vulva (*d*), and the levator ani (*e*) are intact as before. The crura of the clitoris (*f*) are shown, the left one in its relation to the ischiocavernosus muscle.

stant tension would tire out muscle if it were not backed up by fascia to give it periods of rest.

The anatomy is fairly exhibited by the accompanying drawings, which are exact representations of most careful and authentic dissections of specially prepared female pelves, and which were made by Edward Martin(6) under the supervision of Waldeyer. They

are corroborated by the special anatomical studies of these parts by Tandler and Halban, (7) W. Liepmann, (8) and Hugo Sellheim (9). Fig. 1 shows that the one considerable artery in these parts, the internal pudic, lies on the outer wall of the ischio-rectal fossa, at a sufficient distance to make it safe to pick up the levator structures,

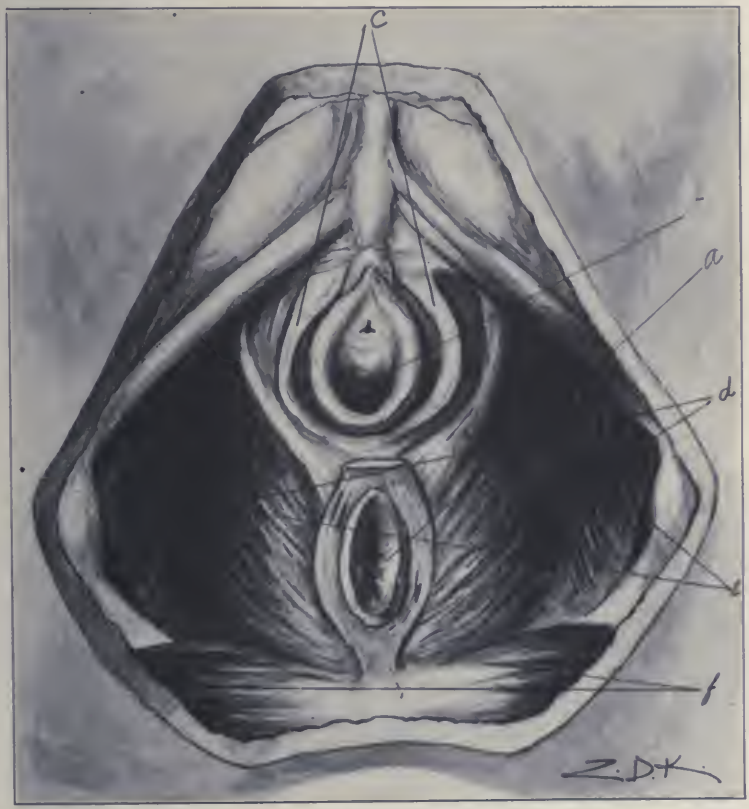


FIG. 4.—(Martin Plate XIV.) All structures of the superficial and middle strata have been removed up to the margins of the rectum (*a*) and vagina (*b*), that have been carefully preserved, the latter as a projecting collar, which is surrounded by the inner remaining edge of the facial diaphragm (*c*). The ischio-rectal fossæ have been cleared out, and the muscles in their walls, the levator ani (*d*), the internal obturators (*e*), and the pyriformi (*f*) have been divested of their facial covering.

down near the rectum, with a needle guided by one or more fingers of the opposite hand. Only venous bleeding occurs, which stops readily when the wound cavity is obliterated in all its parts by the buried suturing. Fig. 2 shows the superficial muscles of the first stratum *a.b.c.*, intact on the left side; but two of them are cut

away on the right side, so as to show the outer surface of the second stratum, the urogenital diaphragm triangular ligament, on that side.

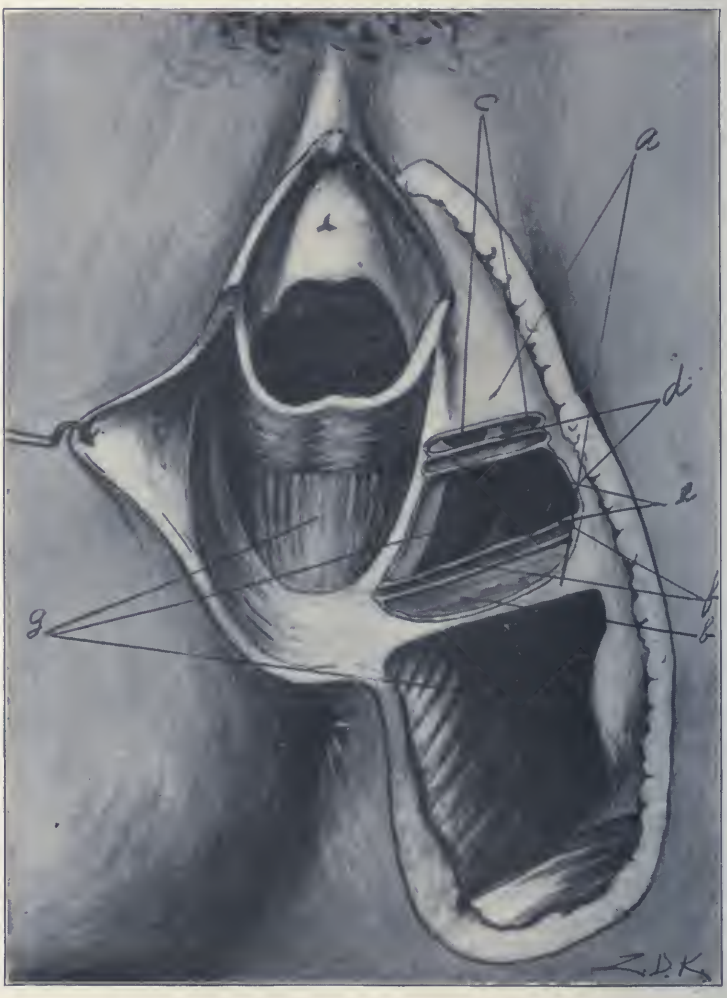


FIG. 5.—(Martin Plate XV.) Dissection showing the three main strata of structures in the female perineum on one side, and the three layers in the middle one (fascial diaphragm). Superficial fascia (*a*), superficial transversus perinei muscle (*b*), and sections of the bulbocavernosus and ischiocavernosus muscles (*c*), together composing the outer stratum. The outer fascia (*d*), the inner fascia (*e*), and the deep transversus perinei muscle (*f*) between these, together constituting the fascial diaphragm. The levator ani muscle, the innermost, and chief stratum (*g*).

Fig. 3 shows this urogenital diaphragm, the trigone, or triangular ligament. Its outer fascia layer has been removed on the right side

to show the deep transversus perinei muscle, which constitutes the middle layer of this three-ply structure whose inner borders constitute the most distinct and resistant structures about the vaginal introitus. Fig. 4 represents the innermost stratum, the levator ani muscle whose outer fascia has been dissected off. Fig. 5 is a dissection of the median line and one side of the perineum, which shows parts of each stratum, in sections.

Fig. 6.—Line of first incision at the muco-skin junction.

As to operative technic Fig. 6 shows about the usual first incision at the muco-skin junction. From there the posterior vaginal wall is dissected up in a flap; bluntly, when possible; or, if necessary, with blunt-pointed scissors. It is raised inward for a distance of 5 to 6 cm., or more, from the plane of the hymen to a point 1 to 2 cm. beyond the previously located proximal border of the levator ani

structures, that have sometimes receded, and on the sides to the level of the white line of the pelvic fascia, as shown in Fig. 8. The levator muscle is traced best by its tense fasciæ between which it lies. It should not be dissected out from these, but should be picked

FIG. 7.—Method of raising the vaginal flap, its thickness being always noted by one or two fingers of the left hand on its upper side and opposite the points of blunt or sharp dissection, to avoid injuring the rectum. No such sharp scissors should be used.

up with them as a composite mass because the fasciæ are fully as important as the muscle which alone would be of little service. Splitting of these parts and uniting them in layers, as is illustrated by Geo. H. Noble(10) is not advisable, because it will simply weaken them. It would take more time than all the rest of the operation:

and it would be difficult to do, down upon the rectum, in a pool of blood, where the union of the bilateral parts should be made. After having been uncovered and located by touch alone, the levator structures are seized, at the side of and over the rectum, by a full curved and non-cutting needle, held in a good needle-holder, and armed with a double thread of chromic catgut. The seizure is made

FIG. 8.—Shows depth and lateral extent of wounds finished bluntly.

under the guidance of the index-finger of the left hand, which holds the rectum out of the way by maintaining an intermediate position between it and the needle point, as shown in Fig. 9. The serviceability of the structures seized, is tested by making a pull upon them with the needle, and another grasp is made if deemed necessary. The needle is then drawn through and carried directly across to the levator structures of the opposite side, which are hooked up in the same manner, under the guidance of the same finger that holds the rec-

tum out of the way, and which stands on guard here between the bowel and the needle point, as shown in Fig. 9. When a satisfactory seizure has been made on this side also, the needle is drawn through and carried back to the first (left) side, and a second suture of the

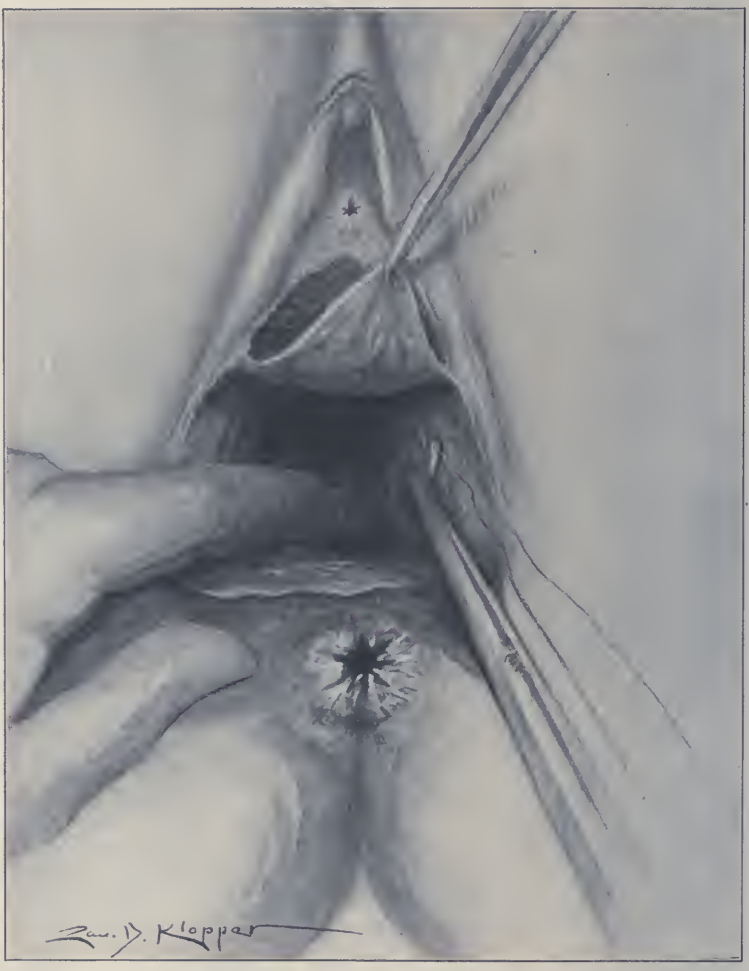


FIG. 9.—The levator ani structures are seized upon each side, closely over the rectum, without sight, in a pool of blood, at a distance of 6 to 8 cm. inward from the skin edge of the wound.

same kind is placed with equal care, seizing the levator structures at points a little posterior or anterior to the first one, in order to secure a wider approximation. The suture is then tied, thus bringing the most important bearing parts into direct union with no other

tissues intervening. After this, the remaining wound is closed, from within outward to the subcutaneous tissues, by the use of the same deep suture circuitously, as shown in Fig. 10, with an occasional

FIG. 10.—Two or three rounds of continuous or interrupted sutures are placed in the levator *alone*, and tied. All succeeding rounds catch, in addition enough of the submucous areolar tissues from the bottom and top of the wound to obliterate dead spaces, and to adjust the vaginal flap in smaller folds overhead.

knot tied in it. Each of these stitches carefully takes a substantial grasp of the lateral bearing structures, notably of the trigone; this obliterates the wound cavity and stops the venous bleeding by re-

peatedly but gently picking up the areolar submucous tissues in the bottom of the wound, as well as on the under surface of the vaginal flap which, thereby, becomes adjusted in small ruffles as a fastened covering of the newly constructed rectovaginal septum. The vag-

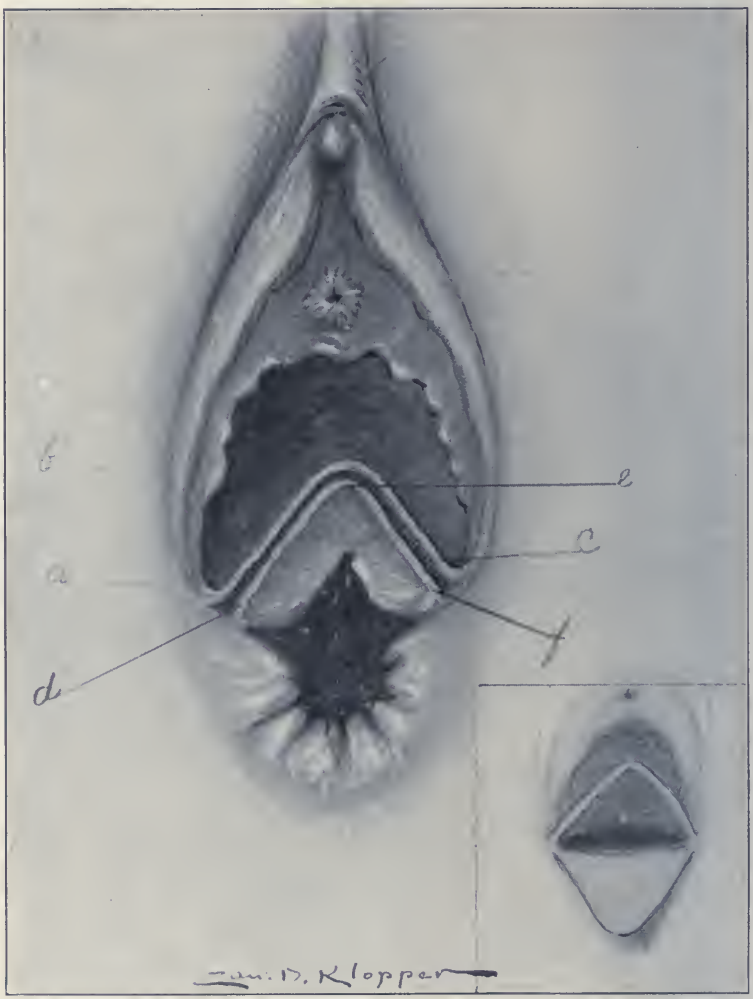


FIG. 11.—Shows incision in vaginal mucosa. From its inner edge *a.b.c.*, a flap is raised to restore the pelvic floor; and from its outer edge *d.e.f.*, the flap is dissected outward for the plastic upon the rectum and anus.

inal flap, thus arranged in small folds and fastened to the united bearing structures beneath it, produces a more massive and durable septum than could be obtained if it were cut away. Of this puckered flap a small tip only is cut away; and then an interrupted silkworm,

or chromic catgut, stitch is placed which takes in the adjacent sides of the skin wound and the ruffled edge of vaginal flap, in the manner of a purse string. The remaining skin wound is closed with similar interrupted stitches, or in a subcuticular manner, as may be

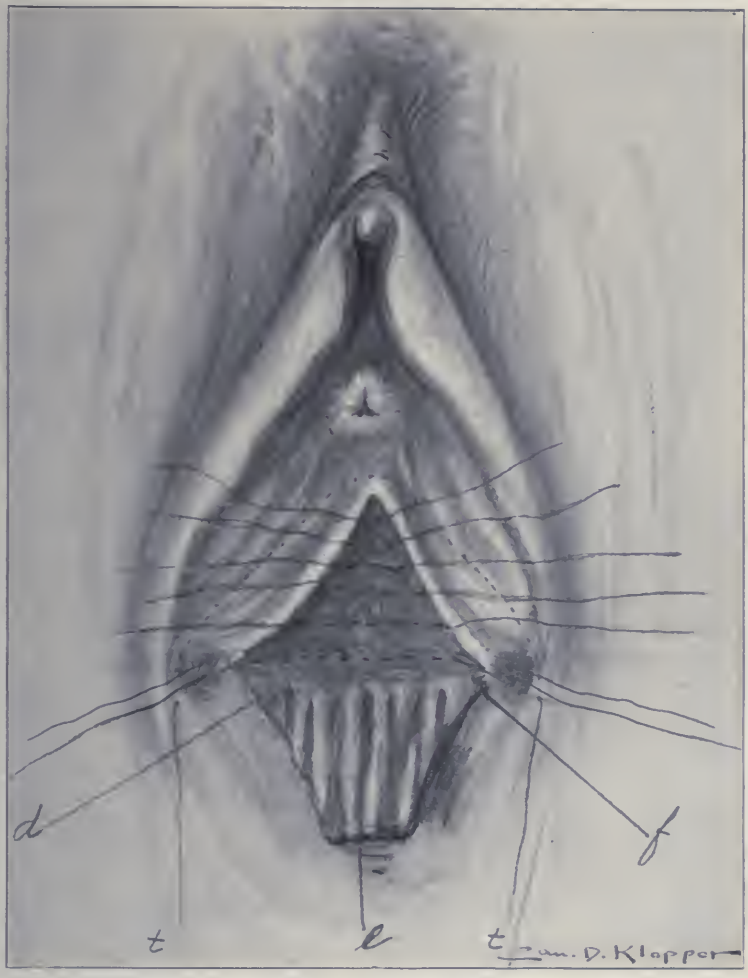


FIG. 12.—Shows the outer flap, *d.e.f.*, turned down over the anus. The rectal tear is closed, over the everted flap, by interrupted sutures of chromic gut that do not come in contact with the bowel mucosa; and tension upon them is avoided by the tension stitch, *t*.

preferred. All the bearing structures are broadly and directly approximated near the median line, which cannot be accomplished by figure-of-eight sutures ever so deeply placed; because the latter bring in nonessential tissues which interfere with direct union of the

FIG. 13.—At the close of this operation for complete laceration, the tip of the everted flap will project from the anus and may be trimmed and stretched to the anal border.

important structures; they, too, violate a general rule concerning normal anteversion of the uterus, that the posterior vaginal wall should not be shortened.

In cases of complete laceration into the rectum, the flap or apron method published by Ristine(11) in 1899, is made use of for the rectal tear and for the external parts, in combination with the operation described for restoration of the pelvic floor. An incision through the vaginal mucosa only, in the form of an inverted letter V, is made upon the posterior vaginal wall, about 2 cm. distant from the edges of the tear in the rectum. The ends of this incision must pass to points about 1 cm. outside of the retracted ends of the torn sphincter ani, and a little beyond them, as shown in Fig. 11. Beginning at the inner border of this incision, *a.b.c.*, the posterior vaginal flap is raised inward far enough to deal with the levator structures, which are traced and united; and the inner part of the wound is dealt with as described for incomplete laceration, out as far as the V incision. From the outer edge of this Fig. 11, *d.e.f.* of the vaginal mucosa is then very carefully dissected outward, in a flap without perforation, to the edge of the tear as shown in Fig. 12. After the retracted ends of the torn sphincter ani have been exposed, they are grasped with rat-tooth forceps, and the muscle is stretched moderately. Its ends are then brought together over the raw surface of the flap by at least two silkworm-gut sutures passed through them singly, and tied with moderate tension.

The edges of the wound above are approximated, and the cavity beneath is closed with fine chromic gut. To relieve the tension on all sutures engaged in this plastic procedure, a submucous silkworm-gut suture is passed around it within the rectovaginal septum. This is tied with moderate tension beneath the tip of the flap which, usually, projects downward in the new anus. This can be left to slough or shrink away; or it may be trimmed off if it is too massive.

REFERENCES.

1. Goldspohn, A. Medicine (Chicago) July, 1897.
2. Goldspohn, A. American Journal of Obstetrics, June, 1901.
3. Goldspohn, A. *Journal of American Medical Association*, Aug. 15, 1914.
4. Sturmdorf, Arnold. American Journal of Obstetrics, September, 1919.
5. Jellett, (Dublin). *Surgery, Gynecology and Obstetrics*, September, 1912.
6. Martin, Edward. Der Haft-Apparat d. Weiblichen Genitalien, Karger, Berlin.

7. Tandler and Halban. Anatomie u. Etiologie d. Genital Prolapse Beim Weibe. Braumueller, Vienna and Leipzig. 1907.
8. Liepmann, W. Atlas der Operations Anatomie u. Operations Pathologie der Weiblichen Sexualorgane. Hirschwald, Berlin.
9. Sellheim, Hugo. Deutsche Frauenheilkunde, 1 Die Geburt d. Menschen, Bergman-Wiesbaden.
10. Noble, Geo. H. *Transactions Southern Surgical and Gynecological Association*, 1902, vol. xv, p. 101.
11. Ristine. American Journal of Obstetrics, May, 1899.

DISCUSSION ON THE PAPER OF DR. GOLDSPOHN.

Dr. Gordon K. Dickinson, Jersey City, New Jersey.—I think, from the way the profession talks, the test of a man's brain power is his ability to do an operation on the perineum. According to the story of to-day, we are trying to standardize it. Every man has his own little fad, his way of doing it, and thinks it is the best. It is because his gray matter is turned in that direction.

Dr. Ill does a wonderful operation after the old-fashioned way with silver wire. I remember the time when I first began to operate on lacerated perineums. We had to put the wire just so and so, one piece to be put in one way, and the other piece the other way, and so on. Dr. Ill does a most excellent job, and the perineums are good. Another man does the operation in another way and his perineums come out very satisfactorily. I think if you will put your mind on your case and study the individual condition, and they all vary because there are so many different structures in the perineum, if you go at it with judgment, the plan which best suits you is the best plan. You cannot standardize it. I could not make a good perineum a la Ill; neither could I make a good perineum according to some of the pictures described this morning. But I have a plan which best suits my fingers and my mind in the majority of cases, and it succeeds pretty well. I was delighted to watch the different plans that were brought up, and they show how mens' minds work differently. To quote old Jacobi, the best way to feed a baby is to feed it with brains, and the best way to feed a perineum also is to feed it with brains.

Dr. X. O. Werder, Pittsburgh, Pennsylvania.—The operation so well described by Dr. Goldspohn has been the one performed by me practically in the same manner for years. The principal difference is that I excise a V-shaped piece of vaginal mucosa extending in some cases up to the cervix. The reason of this rather extensive denudation is the observation made in some of may own cases, as well as those of other surgeons, in which there was a recurrence of the rectocele, not through the parts affected by the operation, but higher up, beginning in the upper portion of the vagina to which the repair had not extended. If we consider a rectocele as a hernia, which it really is, in which the rectum bulges out into the vagina between the separated levator muscles and pelvic fascia, we can readily understand that unless the hernial opening is closed com-

pletely, no matter how far up the vagina it extends, the rectum will eventually force its way through into the vagina again and gradually enlarge the hernial opening. For this reason, in all rather extensive relaxations of the posterior vaginal wall, the denudation is carried well up against the cervix, and in some cases even to Douglas' pouch, so as to be absolutely certain that no open space or weak place has been left between the levator muscles through which the rectum could at some future time protrude.

Dr. David Hadden, Oakland, California.—I would like to say a word or two regarding the illustrations, which we have had this morning and this afternoon, of the structures of the levator ani. According to the statements that have been made, and the illustrations shown, there are no fibers running between the vagina and rectum—at least, very few. I would like to know from Dr. Goldspohn what he approximates if there are no fibers there? If this represents the vaginal and rectal orifices (indicating), the fibers that run from the pubic bone to the coccyx, the so-called pubo-coccygeus fibers described in all anatomies must be the fibers, provided there are no fibers running between the vagina and rectum that we approximate. If these are the fibers we approximate, we make then a figure of eight like this around the rectum and vagina. If that is so, we ought to be able to palpate through the rectum this sling of the levator ani. That I have not been able to do. What structures then are those that we get? Are they levator ani fibers normally between the vagina or rectum, or fibers (pubo-coccygeus fibers) running to the side of the vagina?

Now as to the question of leaving this mucous membrane flap. I feel that, if the operation is properly done, it does not make much difference in the length or shortness of the canal, whether that flap is left or not. But I have felt that leaving a flap which is over stretched mucous membrane will give redundant tissue which is unnecessary, and I have been on the watch for a case that would illustrate that.

In the last six months, I have found two cases, one of a New York surgeon, and one of a Chicago surgeon, two of the best men we have, in which there are ridges down the center of the vaginal canal. In fact, I operated on one woman the week before I left, and took that ridge away because it was giving the patient a great deal of trouble in cleanliness and other ways. We had a perfect perineum, but we had a ridge of tissue about an inch high extending up the vagina as far as the primary dissection was done. At some future meeting I hope to be able to show illustrations of these cases.

Dr. Goldspohn (closing the discussion).—I was glad to hear Dr. Werder speak of dissecting up far enough, even to the cervix, if need be. However, when you build a firm rectovaginal septum 5 or 6 cm. in length inward from the hymen and down upon the rectum, there will be no recurrence of rectocele. That is my experience. I have never seen such a recurrence.

In regard to leaving that flap, it is true what the last speaker has said. If you are not careful when you make your last five or six

rounds of sutures, in closing the middle portion of the wound, to pick up the flap on its under surface at sufficiently numerous points, you will get a ridge sticking up within the vagina. But this can be uniformly avoided. I think the results are better; the septum is stronger when there is no resection at all of the vaginal mucous membrane. I simply sew it down in ruffles so that it gets down solid and will not stick up.

In regard to the doctor's question about the union of the levator fibers back of the vagina and in front of the rectum, I will say that there is such a union normally of the puborectal portion. It is not a very strong one. It can be felt in the nullipara with the index-finger in the vagina and the next finger in the rectum. But that union is usually lost in the torn pelvic floor; and we need to restore that or make a better one by this operation than nature had there before, by uniting the next fibers, the pubo-coccygeal portions of the levator ani, back of the vagina and in front of the rectum.

Dr. George H. Noble did good pioneer work in this line in earlier years, which was published one year after my second paper on this subject, in 1902. He suggested separating the levator structures, dissecting the muscle out from the two fasciæ. That, I think, is a mistake. I do not believe that the doctor has practised that since that time, because the parts are unitedly much stronger than single. The muscle would be of very little service if it were not for the fasciæ. To split them up and sew the different layers separately may be nice in theory, but it does not work out in practice.

There are some good surgeons who make use of figure-of-eight sutures and get hold of the levator structures; but they seem bound to tie on the outside skin. That is wrong. These parts should be united by buried sutures which pull transversely only, and bring the lateral parts into direct apposition with as little tissue between them as possible. Figure-of-eight sutures not only shorten the posterior vaginal wall, but bring other structures in between the important levator and fascial structures which should serve as beams under the floor, so that these will not unite thoroughly and make as durable a union as is obtained when they are brought together directly.

OBSERVATIONS ON THE PROBLEM OF HEMORRHAGE IN OBSTETRICAL CASES.

BY

ARTHUR H. BILL, M. D.,

Cleveland, Ohio.

THE object of this paper is to call attention to a very few points relative to hemorrhage associated with obstetrical cases and to make certain suggestions for measures which are, for the most part, prophylactic in their nature. I am prompted by a realization that the maternal mortality has been unnecessarily high in cases of antepartum hemorrhage, including placenta prævia and complete separation of the normally situated placenta; and that postpartum hemorrhage is unnecessarily frequent, though, to be sure, not commonly fatal. In both of these varieties of hemorrhage it is possible, by more definite precautionary measures, to reduce the mortality of the former and the frequency of the latter.

In the cases of antepartum hemorrhage the cause of mortality, leaving out those cases of sepsis due to hasty and careless methods of controlling the hemorrhage and of delivering the patient, is loss of blood. Deaths from hemorrhage have been due, (*a*) to unwise methods of delivery, and (*b*) to delivery of patients who are in no physical condition to stand the delivery on account of previous loss of blood.

The more general adoption of Cesarean section for the delivery of cases of placenta prævia and accidental separation of the placenta, has resulted in a considerable reduction of the maternal mortality over the older methods, such as accouchement forcé, and abdominal hysterotomy is to be strongly recommended. However, even with improved methods of delivery, the result may be disastrous if the patient's condition at the time of delivery, is such as to make her a bad operative risk. The patient rarely dies undelivered; but the physician, knowing that only with the emptying of the uterus will come the final cessation of hemorrhage, altogether too frequently hastens to empty the uterus of a patient already nearly exsanguinated, and then uses all his resources to combat postpartum hemorrhage which is almost sure to follow. I hold that postpartum hemorrhage

is almost certain to result in such cases because, even in the absence of deep laceration of the cervix and injury of the placental site of the uterus, bleeding will follow from relaxation of the uterus as a result of previous loss of blood. Nowhere in medicine is the vicious circle better illustrated than in the case of postpartum hemorrhage.

In the most serious cases, other methods have been tried without success. The only means of restoring the lost tone of the uterus, and controlling the bleeding, is the introduction of blood into the circulation of the patient. This may save her life, if there is still time left for performing the transfusion. However, we are then dealing with a problem of life and death which no obstetrician would choose to confront. I wish to lay especial stress upon the use of calm judgment in undertaking the delivery of such a patient and to emphasize the fact that, inasmuch as we are dealing purely with a problem of hemorrhage and know that some additional bleeding will surely accompany the delivery, it is our duty, first of all, to fortify the patient in the most thorough and lasting way at our command; and then, and only then, to undertake the emptying of the uterus.

For restoring the patient to a more normal condition, no method can compete with that of blood transfusion. The simplification of transfusion technic, and the more general familiarity with its employment, make it a practical procedure. The transfusion should be begun before the delivery and carried on, as nearly as possible, simultaneously with it. Transfusion should not be used as a last resort if, in the physician's judgment, the patient has lost an amount of blood which, added to that which she must necessarily lose with the delivery, will in the least endanger her life. By this practice, which we may call prophylactic blood transfusion in obstetric cases, the patient will stand the delivery comparatively well; and the mortality, which from various statistics has been put at figures varying from 9 to 35 per cent., may be reduced to 2 and even 1 per cent.; or, in other words, to the mortality of the operation used for delivery.

My first experience with this procedure, seven years ago, in July, 1912, proved so satisfactory, and so well illustrates its advantages, that a record of the case is herewith given:

The patient, a primipara at full term, complained only of a slight "show" and of feeling faint. When seen shortly afterward, she presented the following picture: very pale; pulse of very low tension and small volume; abdomen somewhat distended and tender; fetal parts only partially made out on palpation; fetal heart not heard; a moderate amount of "show." The case presented a typical picture of complete separation of the placenta with concealed hemorrhage. The patient was very carefully removed to the Maternity

Hospital. The hemorrhage, which at first was nearly all concealed, became more and more external, and the patient's general condition grew worse. She gave evidence of having lost about all the blood which she could safely lose. Two facts were apparent: first, that the patient must be delivered as soon as possible; and second, that in her condition she had a poor chance of surviving the delivery. The following procedure was adopted: first, a blood transfusion was performed by Dr. H. G. Sloan, the older method of direct anastomosis with a Crile cannula being used. Immediately after the beginning of the transfusion, the patient was delivered by an abdominal hysterotomy so that the transfusion and the delivery were carried on simultaneously, and the former continued slightly after the uterus had been sutured. The patient's condition was kept absolutely under control throughout the delivery, and at no time were there alarming symptoms of hemorrhage. She was in good condition after the completion of the operation and made an uneventful recovery. The baby was, of course, dead as a result of the complete separation of the placenta. The outstanding feature of this procedure was the continuous safety of the patient, made possible by the simultaneous performance of the two operations, a marked contrast to what probably would have happened if the delivery had been undertaken primarily with a consequent postpartum hemorrhage.

The writer had adopted a similar procedure since then, in cases of this kind, using newer methods of transfusion, but always making the transfusion, as nearly as possible simultaneous with the delivery.

Postpartum hemorrhage, occurring in cases otherwise normal, not infrequently has its beginning in the third stage of labor; no doubt it is sometimes due to improper management of this all-important stage, either by too hasty efforts at manual expulsion of the placenta, or through lack of effort toward promoting contractions.

The more general use of anesthetics in obstetric practice makes it imperative to take unusual precautions against the occurrence of postpartum hemorrhage. Although anesthetics vary in their relaxing effect, this being somewhat greater in the case of ether than in that of N_2O_2, nevertheless, all anesthetics cause more or less of a relaxation of muscular tissue, and the uterine muscle does not escape this effect.

We cannot countenance the practice of allowing the third stage of labor to take care of itself and of paying little or no attention to the fundus of the uterus. The fundus should be watched constantly and stimulated manually, if it relaxes; but this alone is somewhat insufficient in obtaining the best results. While the administration of ergot during the third stage has long been considered contraindicated, the same cannot be said of pituitrin. Instead of bringing about a

tonic contraction of the uterus, we observe somewhat normal but intensified intermittent contractions of this organ; though, to be sure, the relaxation between the contractions is less than in cases in which pituitrin is not given. Again, the effect of pituitrin is very fleeting and wears off before the time the placenta is ordinarily delivered.

The writer has, of late, followed a routine practice of administering pituitrin during the third stage of labor; and from an experience of over one thousand cases treated in this way, he can say that the results are most satisfactory. Compared with those cases treated previous to this time, in which nothing was administered during the third stage of labor, there is a marked contrast between them in the amount of bleeding; so much so that cases of real postpartum hemorrhage are practically unknown where conditions are otherwise normal. In the series of cases mentioned, it can be said that not a single one was observed in which the placenta was retained on account of the administration of pituitrin. Manual extraction of the placenta was resorted to in only three cases; in these the placenta was actually adherent, and not merely retained by the contraction of the cervix. We have, therefore, not the slightest fear or hesitation in administering pituitrin at any time during the third stage of labor; and, furthermore, we would urge the routine practice of administering pituitrin in the third stage of labor in all cases in which a general anesthetic has been administered.

The routine practice is as follows: All patients are delivered under complete anesthesia. As soon as the baby is born, pituitrin is administered hypodermically; usually a full cubic centimeter is given. The uterus is, however, as carefully watched as if no pituitrin had been given. Immediately after the birth of the placenta some preparation of ergot is given. Our custom has been to administer ergotole intramuscularly. The pituitrin controls the relaxation of the uterus during the third stage; the ergot causes a more tonic and lasting contraction after the uterus is entirely empty. While the occurrence of severe postpartum hemorrhage is not common, and in all likelihood the administration of pituitrin and ergot, as described routinely, is not of great necessity in most cases, still, an ounce of prevention is worth a pound of cure and we feel that, inasmuch as no untoward effects are obtained from this plan, its more general adoption should be advocated.

In conclusion, let me emphasize the two chief points brought out in what has been said: first, the importance of better judgment in undertaking the delivery in cases of placenta prævia and in ablatio placentæ, and the value of the "prophylactic blood transfusion;"

second, the value of the routine administration of pituitrin in the third stage of labor to prevent postpartum hemorrhage.

DISCUSSION.

Dr. Asa B. Davis, New York City.—Dr. Bill's experience entitles anything which he says to careful consideration and credence. My own experience has led me to use very little ergot or pituitrin. In the Lying-In Hospital we do not use either of these agents in a routine manner. I have very decided views about pituitrin. I believe that we should no more resort to this agent during labor than we should to the use of ergot. In the service of the Lying-In Hospital we repeatedly witness terrible and fatal results chargeable to the use of pituitrin by practitioners. For example, a few months ago an elderly multipara was brought in with rupture of the uterus. There was no delay in opening the abdomen, which was full of blood and she died on the table. Pituitrin had been used freely. In early November, two years ago, in five consecutive days we received five cases with contracted pelvis, uterus tightly contracted about dead fetuses. Delivery was by craniotomy. Pituitrin had been used in each case. The withholding of pituitrin and a timely Cesarean section would have saved all these children, eliminated the suffering of long labor and the impending danger of septic infection and rupture of the uterus. Five years ago, during the first ten days of July, two cases were sent in from the tenements with rupture of the uterus due, as I believe, to the use of pituitrin. Both mothers and children died. These are but a few concrete examples of the results of the use of pituitrin which actually have come under our observation.

About four years ago, as I have previously stated in this Association, in twelve consecutive cases of Cesarean section I gave pituitrin just before starting the anesthetic. Upon opening the uterus there was very little bleeding. The uterus was tightly contracted, so that the cut edges of the wound were very thick and almost bloodless. No difficulty was experienced in delivering the child; but when suturing the uterus was well begun, in every instance, the uterus rather suddenly relaxed and profuse hemorrhage followed. If pituitrin is to be used during Cesarean section, others have reported that it should be injected as the uterus is about to be opened. Uterine contraction results in about three minutes. Its effect does not last long. Ergot acts much more slowly and over a longer period. I use this as routine in Cesarean operations, injecting 25 minims just before starting anesthesia. Postpartum hemorrhage is rarely seen in our service, considering the number of deliveries.

I am in accord with Dr. Bill when he states that more cases of placenta previa should be delivered by Cesarean section. This operation would save many cases who die for the want of it.

Dr. Abraham J. Rongy, New York City.—I think it is a good dictum in obstetrics, that every case requiring antepartum treatment should go to a hospital, and with careful watching of these

cases by the obstetrician I am of the opinion that fewer cases would have to be Cesareanized. However, a patient who bleeds more or less profusely and whose cervix is undilated, with no means of accurately telling whether we are dealing with a central or marginal placenta-previa, should be Cesareanized in the interests of both mother and child.

With regard to the use of pituitrin in the third stage of labor, I must say that I have not been so fortunate as Dr. Bill in his series of 1000 cases. I have used pituitrin in the third stage of labor with the resulting continued contraction of the cervix, so much so that it was impossible for the placenta to be delivered. In one instance it was fully three hours before the cervix was sufficiently relaxed for placental delivery. It seems to me that before using pituitrin the patient should be examined as to the condition of the cervix. With the cervix intact, the chances of contraction are correspondingly greater and we are likely to get into trouble by using pituitrin in the third stage of labor. I still use pituitrin before performing Cesarean section.

Dr. Irving W. Potter, Buffalo, New York.—Pituitrin is used immediately following delivery of the baby by me in almost all cases, and it is also followed by ergot when necessary. There is one objection, as Dr. Davis stated, namely, exaggerated afterpains. We find following that method we get a firmer contraction of the uterus and the placenta is expelled quicker.

There is one point about the giving of pituitrin that is important, namely, it should be given immediately after the delivery of the baby. If you give pituitrin after the birth of the child you will not get any such contractions as Dr. Rongy spoke of.

Dr. Ross McPherson, New York City.—Some years ago our Secretary (Dr. Zinke) read a paper before this Association in which he advocated Cesarean section in placenta previa, and the Association opposed him, and then a few years later I wrote one on the same subject and was likewise opposed. It now seems gratifying to know that it is the general consensus of opinion that the operation is a good thing to do in certain types of placenta previa, with which I most heartily agree.

In general, I think Dr. Bill's paper sounds a very excellent warning note in regard to the use of pituitrin. I had the pleasure of talking to him about the use of it in the third stage yesterday, but I have not tried it in that connection, being afraid of it for the reason mentioned by Dr. Rongy. When a man has had the experience that Dr. Bill has had with it, however, we cannot take his statement lightly, and it deserves a good deal of thought before we discard it entirely.

In regard to its use before Cesarean section, if given just at the time the incision is made it facilitates uterine contraction. Its efficacy in making these patients void and in the prevention of distention after operation is most satisfactory.

Dr. Bill (closing the discussion).—I heartily agree with Dr. Davis that pituitrin in the first and second stages of labor is a

dangerous thing and I very seldom employ it. The reason why I started to use it in the third stage of labor was the fear of postpartum hemorrhage. After one has had some experience with severe cases of postpartum hemorrhage and has almost lost a patient, he is willing to resort to almost any precautionary measures to prevent it. If there is anything I dislike to treat it is a marked case of severe postpartum hemorrhage.

I have not had the experience of which Dr. Rongy speaks, of having the placenta retained in the uterus. Pituitrin is given immediately with the birth of the child, and in my experience the effect of pituitrin does not last anything like three hours. Its effect is fleeting. It wears off by the time when we need necessarily deliver the placenta.

There is one further point which I wish to mention. Dr. Goodman spoke of a case of hemophilia and the method of treating such a case. Prophylactic blood transfusion would be the proper means of handling that particular case.

MY EXPERIENCE WITH CASES OF VERSION DURING THE PAST YEAR, SEPTEMBER, 1918, to SEPTEMBER, 1919.

BY

IRVING W. POTTER, M. D.,

Buffalo, N. Y.

Mr. Chairman and Gentlemen.—During the past two years a number of physicians have visited me in order to witness my technic in performing a version, and it is their questions and remarks that have suggested this brief paper. The impressions gained from talking with them lead me still further to the belief that very few men understand the technic, or the advantages, of a properly performed version. This ignorance is due largely (1) to an almost complete lack of teaching of this subject in our medical schools today; and (2) to an amazing amount of inactivity, or want of initiative, on the part of the practitioners, especially the teachers and professors of obstetrics. These two reasons, I think, account mostly for the nonemployment of this most important and helpful obstetrical procedure.

Since our meeting last year I have, personally, delivered 1010 women, 450 of whom were primiparæ and 560 multiparæ. Among them were fourteen pairs of twins. For various conditions version was performed 680 times; of these, 300 were primiparæ, and 380 multiparæ. For delayed anterior rotation of the occiput, from either the right or left occipito-posterior position, there were 545 cases. There were four face presentations, with the chin either anterior or posterior. Of prolapsus funis, there were nine cases; of arm presentation, three cases; of placenta previa marginalis, eight cases. Forty-two vertex presentations were delivered by forceps, as the head could not be lifted out of the pelvis, because of firm uterine contractions. Eighty-eight cases were seen in consultation with physicians, and eleven cases with midwives.

Twice the forceps were applied to the after-coming head. I believe that, as we become more familiar with the proper method of version, we shall find it unnecessary to apply the forceps to the after-coming head as often as in the past. My maternal mortality has been nil; the maternal morbidity has not been greater than in other methods of delivery. My histories and temperature charts

prove this fact. There were no lacerations of the maternal soft parts that required more than simple immediate repair. None of the tears observed extended through the musculature of the perineum.

There were forty-three still-born children in the 1010 deliveries, or 4.25 per cent., which is not above the average loss of still-born children in the ordinary practice of midwifery.

Because of persistent reports that my fetal mortality is high, I here submit a complete report of all the certificates of still-born children, together with the causes of death, which I filed in the Health Department of the City of Buffalo, for the year ending August 31, 1919.

Faulty position of the presenting head: Persistent L. O. P., four; breech presentation, in primiparæ, four; disproportion between pelvis and child, resulting in craniotomy on after-coming head, one; hydrocephalus, four cases; one of which required craniotomy on the after-coming head; and another was complicated by a large ovaian cyst, which was afterwards removed by operation. There were four cases of placenta previa, two central, and two marginal implantations; one of them was pregnant only six and one-half months. Cord complications caused seven deaths. One had a complete knot in the cord; in two, the cord was around the neck once; in one, twice; in three, the cord was prolapsed and without pulsations; one of these had a contracted pelvis. Malformation of the child occurred three times; one, malformation of chest and no sternum; one, abdominal dropsy; one, spinal bifida with hydrocephalus and double club-feet. In cases in which the mother had influenza five children died; two were born at eight months; and one at six months; one was a macerated fetus at nine months; and one a miscarriage at four and one-half months, the mother having diphtheria. There were five cases of toxemia. One of them was treated during the entire period of pregnancy for albuminuria; one was a case of premature labor at six and one-half months; one premature labor at six months, the mother having convulsions; in two the mothers were victims of eclampsia. In three cases the cord was so short as to cause detachment of the placenta. In three additional cases deaths occurred because of long delayed transverse presentations.

The following are some of the questions put to me by visitors and others: What is the condition of the cervix when you attempt version? What position does the head occupy? How far down is the head before version is attempted? Why do you bring down both

feet, instead of one foot? Why is the anterior arm delivered first? Why don't you hasten delivery after the umbilicus can be seen? How do you overcome extension of the head and of the arms over the head? How do you save the mother's soft parts, especially the perineum, from lacerations? Why your apparent indifference as to the child's breathing immediately after birth?

1. The cervix must be obliterated and the os dilated or dilatable, before version is attempted. This condition is easily determined by careful examination. The cervix need not be entirely obliterated if it is soft and easily yields to the advancing hand.

2. The position of the presenting head is of no particular importance. A version can always be successfully performed if the presenting head can be lifted above the brim of the pelvis. Sometimes the head is so wedged in the pelvis, when the waters have drained away, that version is impossible. When this condition obtains, delivery by forceps, or other means, is necessary.

3. Both feet are brought down, because the delivery is easiest when this is done; and, if necessary, in the interest of both mother and child, labor can be terminated more quickly. By pulling on both feet the obstetrician distributes traction more evenly, and thus secures a better dilating wedge.

4. The anterior arm is delivered first because, by so doing, we relieve the stretching and tension of the soft parts of the mother, and permit delivery of the posterior arm with greater ease on that account.

5. The reason why I do not hasten delivery after the umbilicus comes into view is that experience has taught me that haste is unnecessary; that severe complications, such as extension of the arms and of the head are very apt to take place when we interfere with the natural forcing powers at this particular stage of delivery.

6. Extension of the head is overcome by aiding flexion of the head with the fingers of one hand in the child's mouth, and with the other hand making gentle pressure upon the head over the pubes.

7. The perineum, and soft parts of the mother generally, are saved, first of all, by deep anesthesia; secondly, by having the patient in the partial Walcher position, which gives one good control of the dilating parts, and admits of slow and safe delivery of the head. There is no need to hurry.

8. I am, apparently, indifferent to the child's breathing immediately after birth; here, too, experience has taught me that nearly all of the babies begin to breathe spontaneously when left alone, provided the heart is beating. Rough handling of the baby is never

tolerated. As soon as the mouth is exposed, the baby is raised up to let the mucous run out of the mouth. This is usually all that is done; but occasionally, when respiration is unusually delayed, a catheter is passed into the trachea.

I have delivered by version, and reported, 1888 women without a maternal death, and without serious injuries to the soft parts. I have observed no alarming hemorrhages; and the period of involution of the uterus, in all of these cases, was shorter, and there was less lochial flow during the lying-in period. Convalescence, too, was more rapid. I attribute this favorable condition to the elimination of shock usually experienced by patients who go through a long second stage of labor. In all of these patients there were also present greater strength, and a better sense of well-being at the end of the puerperium.

The fetal mortality was certainly no greater than that which is attendant upon other methods of delivery, and I challenge anybody to show me a lower fetal death rate. Cord complications must always be seriously considered when we speak of still-born children. I believe the cord is responsible for the greatest number of fetal deaths. In many cases this is not recognized on account of the concealed type of prolapsus funis, when the cord is caught between the head and the brim of the pelvis, and the death of the child follows from pressure upon it.

Let me epitomize once more: 1. The cervix must be completely dilated before version is attempted, or the os must be soft and easily dilatable. 2. Deep anesthesia. I prefer chloroform. 3. Rubber gloves, reaching to the elbow, should be worn by the operator. 4. Version should not be attempted before the patient's bladder has been emptied with the catheter. 5. The vulva should be cleaned and shaved, and every antiseptic and aseptic precaution taken, before the operation. 6. Primiparity is no contraindication to version in the hands of a competent and skilful man. 7. Both feet, instead of one foot, should be brought down at the same time. 8. No attempt to deliver the arms should be made until the scapula is outside of the vulva. The anterior arm should always be delivered first. 9. The operator must remember that, in the delivery of the head, extreme flexion is necessary, and that this flexion can be best produced by placing the fingers of one hand in the child's mouth, and by making gentle pressure upon the head over the pubes with the other. If extension of the head takes place, notwithstanding, complications at once arise; but in the hands of an experienced operator, extension of the head does not occur, or, at all events, is

very infrequent. 10. When the chin and mouth have been delivered, the mucous will run from the child's mouth and nostrils, or it may be milked out by gently stroking the neck; and thus many children will breathe before delivery of the head is complete. Therefore haste is unnecessary. 11. Too great pressure upon the mother's abdomen, during delivery of the head, should be avoided for fear of injuring the bladder or lower anterior uterine wall. 12. The after-coming head may be delivered by forceps if necessary. 13. The operator should at all times have a perfect knowledge of the position of the child *in utero* before version is attempted, and an exact knowledge of this can be ascertained only by introducing the hand to the fundus and exploring the uterus and the fetal parts carefully. 14. If the membranes have not been ruptured, it is well to separate them all around, and as high up as possible, from the uterine wall before rupturing them. The rupture should be made high up for the purpose of retaining as much of the amniotic fluid as possible. 15. When the knees of the child appear at the vulva, version is complete. 16. The operator should be master of the situation at all times, and with the child's chest resting in his hand, he can watch the fetal heart. I have never broken an extremity in a living baby during version. On two occasions the humerus was broken in delivering dead babies, and when haste was necessary in the interest of the mother. 17. The extreme lithotomy position is not always the best for the patient when a version is performed. The modified Walcher position admits of better results by relaxing the soft parts of the mother; this position can be obtained only by having the assistance of two attendants, one on each side, or by allowing the feet of the patient to rest upon two chairs if assistants are not at hand. 18. When the child is born, it is placed on its right side across the abdomen of the mother. This position aids in the closure of the foramen ovale. The child remains upon the abdomen until the cord is tied and cut. At this point I should like to enter a protest against the too common practice of spanking or beating the baby to make it breathe; this is unnecessary and may do harm. I rarely have to do anything, except hold the baby up with its head down to allow the mucous to run out of the mouth, or blow a few times upon the child's chest, to establish respiration quickly. Sometimes we breathe into the child's trachea through a small catheter; but not very often. In my early practice I did this more frequently, but now I know that haste and anxiety in inducing the child to breathe are seldom necessary. 19. The third stage of labor may be completed by delivering the placenta manually. It is

my practice, however, to administer, by deep hypodermic injection into the muscle of the mother, 1 c.c. of pituitrin immediately after the birth of the child; and, in a very short time, the placenta is expelled with very little hemorrhage.

The maternal mortality, in properly selected cases, should be nil. The maternal morbidity is no greater than that in normal cases. My records and temperature charts prove this statement. Compression injuries to the baby's head are very rare. In my experience the mutilation of the soft parts of the mother is less than in forceps deliveries; and, in the end, these patients depart for home in good condition, happy, and well satisfied.

DISCUSSION ON THE PAPER OF DR. POTTER.

Dr. James A. Harrar, New York City.—Mr. Chairman: According to the rules and our experience in version for obstetrical abnormalities, we should oppose this somewhat revolutionary procedure advocated by Dr. Potter.

Last Spring, however, I had the good fortune of spending a day in Buffalo with Dr. Potter, and saw him work. During twelve hours he performed one Cesarean section and four versions, three of which I witnessed. The versions were done to shorten labor and do away with most of the second stage. The technic was as he described. One baby weighing over ten pounds was born in moderate asphyxia. He had spent fifteen minutes in the extraction from the birth of the umbilicus. Beyond stripping the pharynx externally with the finger, no attempts at resuscitation were made, the baby simply being laid down. In a minute or two, however, it began to breathe and cry spontaneously. I also visited nine postpartum patients with him and examined their charts. All were in perfect condition. All had been delivered by version.

Now, my conception of version and yours is derived from the results of the operation in abnormalities; in transverse positions, in placenta previa, in prolapse of the cord, in contracted pelvis, in delivery hurried for the sake of the mother or child. Along these lines let me describe the results of the New York Lying-In Hospital in the last 20,000 confinements. Seven hundred and eighty-eight versions were done, about one in every twenty-five deliveries. Of these, 88 were done on macerated and dead fetuses, leaving 700 on living fetuses. Of this 700, 82 were stillborn, lost during the performance of version, or 11.7 per cent.; and 55 or 8 per cent. died within a few days, hours, or minutes after delivery. In all, 137 infants, 19.7 per cent., succumbed in version delivery on living infants. These figures shape up with those of other clinics in abnormality versions, *i.e.*, in versions done with some obstetrical abnormality as an indication.

We might call Dr. Potter's procedure "habitual version." He does it to shorten labor, and to make it easier for the mother. And he gets as good results as most of us do in our normal and forceps

vertex deliveries. My opinion had been to the contrary, but I am forced also to believe with better results to the perineum.

My difficulties in agreeing with Dr. Potter have been in comprehending how he can get the proper stage setting to make version feasible or safe in so large a majority of his confinements. So many primiparæ have the head engaged or low in the pelvis before cervical dilatation is complete. So often a head is already through the cervix and in mid-pelvis when we first see the case. His answer is this: most heads in the pelvis will go up with moderate ease before attempting the version, the small minority he allows to proceed as vertex.

My pet demonstration to students has been that of version on the Budin mannikin. Insistence has always been laid on bringing down the anterior leg, the breech slid by the brim easier, and the half breech plus the extended leg made a bigger volume to more surely render cervical dilatation complete; the posterior arm was always to be delivered first, if possible; more room was said to be in the hollow of the sacrum. Episiotomies were to be recommended in primiparæ to give more room to deliver the arms. The delivery was to be hastened after the birth of the umbilicus, or the child would not survive. Partial anesthesia was to be preferred during the breech extension after the version so the uterus would contract with the pull of the operator, and better maintain traction and prevent the arms from slipping up. All wrong, if I could believe what I saw in Buffalo.

However, I am sure this is a procedure we must hesitate to advocate for general use. Habitual version is for the expert obstetrical surgeon only, and I feel we might widen rather our present indications for version than do version as often as we possibly can.

Dr. Potter has had a rare experience, and his results are brilliant. I never saw a version done as well. But if average men do versions freely, following the textbook description, manually dilating the cervix, pulling on one leg, hastening excitedly at any time, going after the arms high up, or with more than one finger, they can expect the customary 18 to 20 per cent. fetal mortality, and the birth canal ruptures and lacerations.

It is a difficult proposition to discuss fairly, but go and see him do it. You will at least come away determined to wait for complete cervical dilatation before ever attempting version, to use the long rubber glove and avoid starting tears, to employ complete anesthesia throughout, to make a slow gentle extraction, allowing five to even twenty minutes after the umbilicus is born, and to treat the newborn gently and wait for spontaneous breathing.

Dr. Arthur J. Skeel, Cleveland, Ohio.—I have been much in doubt whether to discuss this paper to-day or not. At our meeting in Detroit, Dr. Potter did me the compliment of saying that when he read his first paper I opposed it, and that this body of representative men followed me like a flock of sheep, which I know is not true. At that time I said this: If Dr. Potter could deliver these women by version with a small number of tears only up to the muscle which I take to be first degree tears—if he could deliver

all these women with no more than tears of the first degree, all his women should be delivered that way. I see he has agreed with me, and is delivering the vast majority of them that way.

Dr. Potter's expertness in this operation I have no quarrel with. He should be expert. I have no doubt that he is. I cannot help still believing, however, that no change so radical in our procedures as this should be based upon the statistics of one man. That does not imply any question of his statistics, but it means that our operative procedures must be made on accumulated experience, must be based upon the experiences possibly of a large number of men who are reasonably expert.

I have listened again to-day to his discussion of the technic. I see nothing about it that is different than we have been accustomed to do it. The matter of bringing down two feet, I believe, is correct; I have always practised it. The matter of deep anesthesia is one I have insisted on for version. Whereas I ordinarily use gas I have always said that gas is contraindicated in version. We need deep anesthesia to secure complete relaxation. The whole matter resolves itself into this: I have no doubt Dr. Erdmann, or anyone, could come here after a year or two attempting it and report a thousand cases of appendix removal in normal patients without any mortality. In fact, that was proposed when appendectomy first became successful,—because so many patients died of appendicitis it was advocated to remove the normal appendix. Now, if expert surgeons can do that and get away with it, I do not doubt but that Dr. Potter can get away with version. However, if it should go out from this Association that version in a normal case is a proper procedure, it would be a calamity, because no matter how expert he has become in this procedure, it does not mean that all the rest of us can become as expert as he, or that the vast bulk of men doing obstetrics will get away with any statistics like these.

Dr. Abraham J. Rongy, New York City.—For three years I have persistently opposed Dr. Potter's method of delivery on clinical grounds. This year I will say this: If nature intended women to be delivered as Dr. Potter delivers them, it would normally put the breech first instead of the head. Babies, however, are placed head first, and that is the way they were intended to be delivered. I have no doubt that Dr. Potter does exactly what he says he does; furthermore, I have no doubt that Dr. Potter is most expert in doing version, and I have no doubt that his statistics are correct. What must happen in the profession as a result of such teaching? Four or five men, after Dr. Potter's article appeared in the American Journal of Obstetrics and Diseases of Women, looked upon version as a very easy thing. Knowing that Dr. Potter had some five or six hundred cases in which he performed version without maternal mortality, they attempted the same procedure with results most abominable not only to the mother (so far as perineal lacerations are concerned), but so far as the children were concerned.

I agree with Dr. Skeel that this Association, with only Dr. Potter's experience, cannot afford, at this time, to endorse delivery by version

as Dr. Potters advocates, for in the hands of the mediocre obstetrician, or even in the hands of the fairly expert obstetrician, the results cannot be good, and it must necessarily work harm to both mother and child

Dr. J. Henry Carstens, Detroit, Michigan.—There is one thing I have noticed, and that is, Dr. Potter is a hypnotist. He seems to hypnotize every one of those who go to Buffalo and see him do version, and perhaps if I should go there and was susceptible to hypnotism I would be convinced the same as others. I know that Dr. Hayd recommends it because it is a good thing. Our friend Zinke says the same thing. They all say that Dr. Potter is honest; that he means well, but that does not mean we should advocate this method generally. An assistant of mine, who does a great deal of obstetrics, and is devoting himself entirely to it, went to Buffalo, and when he came back to Detroit Dr. Potter had him hypnotized. He though it was the most marvellous thing he had seen. It certainly shows that Dr. Potter is an expert in version, but I must say I believe in the *vis medicatrix naturæ* that you should let nature take its course. I believe it was intended that the fetal head as a general rule should come first (in 97 out of 100 cases) as we know from our statistics, and those 3 odd per cent., where we have shoulder and other presentations, can be assisted by version.

I believe strongly with Dr. Rongy. I would not have spoken were it not for the fact that what we say here goes all over the country, and the general practitioner who does or sees a few obstetrical cases a year cannot become expert like Dr. Potter, and it is simply going to be a disastrous affair if he performs version on this woman and that woman, producing a great deal of injury to the mothers, and causing the death of many of the children. I think this kind of practice should be limited to those who are expert and can become expert and have the opportunity of being experts.

Dr. Magnus A. Tate, Cincinnati, Ohio.—I did not expect to discuss this subject, but the remarks of the last speaker brought me to my feet.

I went to see Dr. Potter, and he did not hypnotize me. I saw Dr. Potter do a version in one case only. I will say this, that Drs. Potter and Hayd, of Buffalo, are two of the finest gentlemen we have in this Association, and very courteous to visitors. As I have said, I saw Dr. Potter deliver one case, and am sorry that I could not see him deliver more, but I was not impressed with Dr. Potter's method in handling that case. In other words, I know that case should have been delivered in a normal way.

Is Dr. Potter sincere? Yes. Does he believe that he is doing good work? Yes. Is he skillful? Yes. If we accept his teaching, we have simply got to change the entire history and mechanics of labor. If this method were accepted and used by the general practitioner the fetal mortality would be enormous; lacerations of soft structures and damage to the bony pelvis would be extensive. It would be a calamity.

I thank Dr. Potter for allowing me to see him practice his method but I came away absolutely unconverted.

Dr. William Gillespie, Cincinnati, Ohio (by invitation).—I would rather not have responded to this call as I am not a member of the Association, and I feel a little timidity about expressing exactly what I feel about this paper.

In the vast majority of primiparous labors the head is deeply engaged in the pelvis six weeks before the onset of labor. To the man who knows obstetrics, if he does not find the head engaged deeply in the pelvis in a primiparous woman four weeks before, he knows it is his duty to find out why. None of us have done consultation obstetrics without demonstrating time and again that the head can be lifted out of the pelvis and version done. I have done it for sudden prolapse of the cord in a good many instances; but it puts the structures of the mother on a decided stretch. When the head is thoroughly dilated in a primipara, or dilatable—and the difference between dilated and dilatable in primipara is very little—the head is already on the pelvic floor, and a simple forceps procedure is indicated. To do version for posterior position of the occiput when I have not in twenty years had any difficulty in converting a posterior position of the occiput into an anterior position, is taking chances with nature which I do not prefer to take. To never bring down the arms until the scapulæ appear at the vulva absolutely rules out every difficult version where there is disproportion between the head and pelvis. The difficulty in disproportion in extracting the after-coming head is to get the head through the brim at all. One head and two arms will not go through the brim with as much facility as one head. Nobody ever saw extension of the head who did not monkey with the band wagon, so to speak. Make traction on the neck and you will not have extension of the head, that is a bugbear that has come down to us from antiquity.

There is one thing I can hardly believe, and that is, that a man can deliver a thousand and ten women by version, particularly that number of primiparas, with slight lacerations. It is mechanically unsound to say that you will do better by pulling down two legs. There is a vast difference between the head and the collapsed body before the lungs are dilated. I am not afraid of version, but version is a major operation entirely and should not be undertaken lightly, and to pull the head rapidly or slowly through the pelvis in time to save the child's life cannot be done without many serious lacerations. How can you take twenty minutes to extract the after-coming head and get a living child? The uterus has retracted down to the point where there is very little intrauterine space. The area of the uterus to which the placenta is attached has become so small that the sinuses of the uterus are closed. I think if he examines more carefully he will find a large number of cervical lacerations and a great many pelvic prolapses following this procedure.

Dr. William D. Porter, Cincinnati, Ohio.—I do not rise to discuss this paper but simply to ask one or two questions. In the first place, I would like Dr. Potter to give us a definite idea about the average time that exists after the umbilicus appears or after the breech is born until complete delivery is effected. I would suggest in his future work that he keep absolute record of the time to be of

great value, because I take it, the interval is longer than we have been led to believe is possible.

Does the mortality, which is almost 5 per cent., include the children who died within a few days after delivery?

Suppose we have a case in which the cervix is fully dilated and in which the head is more than half within the pelvis, will you give us your reasons for version to do away with the long suffering? How can you prove it is better to push the head up and do a version rather than put on forceps and deliver and take all the time you want?

Dr. E. Gustav Zinke, Cincinnati, Ohio.—Some thirty years ago I was interested in a friend, who was following Christian Science and other similar fads. To be convinced of the truth of what he believed he saw, I attended several of the meetings with him; but neither the Christian Scientists, nor Spiritualists, succeeded in hypotizing me. I know Dr. Potter did not hypnotize me.

In the manner of Hamlet, I may say: To turn, or not to turn? That is the question. Let us be concerned with the facts alone. Dr. Potter turns frequently for the sole purpose of curtailing labor; and, as he says, to maintain the vitality of both mother and child, as well as to save his own time. He has given proof that he does no injury to his patients nor to the children he delivers. Is he the only man able to practice obstetrics in the manner he does? Is it impossible for others to learn to do what he does? Can he teach others his method of turning the child? During the past year many physicians have visited him to see him at work, and some of them, after following his practice for a period of from four to six weeks, have written him that they have delivered, successfully, by his method, between twenty-five and fifty women. This shows that Dr. Potter is not only willing, but able, to teach what he is doing.

The same objections that have been raised to-day against Dr. Potter's practice were raised against performing Cesarean section for placenta previa. Some of the oldest and most respected obstetricians, men for whom I have had the highest regard, and still have, one of them a Fellow of our Academy of Medicine, and my teacher of obstetrics, figuratively, wiped the floor with me in his effort to discount my advocacy of Cesarean section for placenta previa. And yet, what I then proclaimed (1901) stands unharmed, and is now universally accepted.

Let us go a little slow. I am glad there is opposition; that will test the mettle of the man and his practice. If Dr. Potter can go on with this work, if he can teach others to do what we now know he does so well, and, thereby, lessen the duration of labor, the duration of pain and suffering, and even prevent frequent injuries to mother and child, who is there that can, fairly and justly, object to his practice?

I have seen him perform eight versions; six times in primipara. Only two tears occurred in these eight cases. In neither instance did the tear extend into or beyond the muscular structure of the perineum. This is a serious problem, and should not be considered lightly. But Dr. Potter is able to take care of himself; I do not

have to defend him. Let us look at the facts as he has presented them. I do not hesitate to vouch for the doctor's veracity.

Dr. Potter (closing the discussion).—I want to thank Dr. Harrar for the fair and judicial manner of his discussion. Dr. Skeel riled me at Indianapolis very much. Now, he amuses me. That is the difference in my attitude towards Dr. Skeel. He will come around to my way of thinking I am certain, but it will take time. Rongy is getting more pliable every year I meet him. He will be all right after a while. (Laughter.)

I am glad Dr. Tate spoke as he did for that gives me a chance to say something. I did not try to hypnotize Tate or Mosher who was with him. I tried to get a case suitable to show him and could not do it. I showed him one, the meanest case I have ever had to deliver on account of the surroundings and lack of assistance. It was not a good case to show at all, and of course made an unfavorable impression upon Dr. Tate.

As to the remarks of my friend Dr. Gillespie, he has got to change his ideas entirely, because I tell you, old man, this thing has come to stay, and I don't care anything about how long it takes to deliver a baby. It sometimes takes me twenty-five minutes from the time the knees are out. I never time myself. I said to the anesthetist who is with me all the time, how long do we take? He replied, "I am ashamed to tell you." We are never in a hurry; we never look at the watch, but time and again I find it takes twenty-five minutes, and I told the anesthetist to cut that five or six minutes out; to get away from it. That answers one of Dr. Porter's questions. The stillborn babies I spoke of were dead when born. I have been connected with a Catholic institution in the City of Buffalo for a number of years and have held that position through changes in administration, and if my fetal mortality was great I could not hold my position ten minutes in that institution. That is an answer to Dr. Porter's question.

If I can lift the head through the pelvis, I can do version quicker than you can put forceps on. You have got to change your teaching entirely in regard to this question of Version.

Another thing, this procedure can be killed by the medical profession if it is brought up in the circles of medicine in several ways. You may say what you please; I don't care; because I have got the women with me. Not only have I got primiparous women, but multiparous women, and what are you going to do? You will have to get out of the way. The public have taken this thing up in my locality, or I would not have 300 cases engaged ahead as I have had in the last two years. I will show everything I have. I have never hidden a thing from any man who visited me.

Dr. Carstens.—I would like Dr. Potter to answer this question, is it not natural for the head to come first, and if it is a better way than letting nature take its course? Do we do anything better than nature?

Dr. Potter.—In answer to Dr. Carstens, I would say it *is* better to reverse the order of things sometimes.

INVERSION OF THE UTERUS.

BY

H. WELLINGTON YATES, M. D., F. A. C. S.,

Detroit, Michigan.

PROBABLY the most unique definition to be found for this anomaly, would be: *the uterus is upside down, and inside out;* that is, the fundus uteri becomes the lowest, and the cervix the highest part of the organ and the external surface becomes the internal.

Frequency.—Jardine(1), the Glasgow Maternity Hospital, found that this accident occurred three times in 51,290 cases. Winckel(2) had not seen a complete inversion in 20,000, nor Braun a single one in 250,000 cases. Denham had seen one inversion at the Rotunda Hospital, Dublin, in 100,000 cases.

At the Petrograd Lying-In Hospital, one of the largest of its kind in all Europe, Beckman(3) had not seen a single case in 250,000 deliveries, while Madden(4) had observed it but once in 190,000 labors in Dublin. W. C. Jones(5), after a study of collected figures, shows an average of one case in 127,767 cases.

Records collected from the maternities of Detroit institutions, or those from which any statistics could be obtained, show the follwing:

Grace Hospital reports, 4247 confinements during the last twenty-eight years, with one case of complete inversion. Harper Hospital, in the last three years, has had 2100 obstetrical cases, with no inversions of the uterus. The Woman's Hospital has had 8600 confinements without inversions of the uterus. Providence Hospital has had, since 1909, 7200 confinements, without a single case of inversion of the uterus in this series. One case, however, of complete inversion of this organ was brought into the service after the patient had been delivered at home.

With relation to the foregoing statistics, it is evident that they have been collected from large maternity clinics and that they are valuable as far as they go but they do not indicate the frequency with which inversion may have occurred in women who are confined at their homes. The majority of these large clinics are so organized that the best possible technic is in effect, and all assistants are subject to orders from the heads of their departments. We should there-

fore expect a far greater number of inversions among those treated individually in their own homes and by men who are either ignorant or careless of proper prophylactic measures for its prevention. It is, therefore, impossible to obtain true statistics in this latter class, inasmuch as the greater proportion of physicians make no reports of them and, indeed, make no personal case records at all; and so while Jones, in his study of collected figures, shows but one case in 128,767, this cannot be a criterion of inversion of the uterus found in private practice. Kehrer(6) places the frequency of all cases as one in 2000 which, indeed, seems to me to tally more perfectly with what we might expect.

In talking with my colleagues and hearing of their experiences with other physicians in general, I conclude that this complication is a rare one, though not nearly so infrequent as the above figures would indicate. There are those rare instances in which inversion takes place spontaneously in the third stage of labor which is no reflection upon the attending obstetrician but, in general, the reverse is true, and we find its presence is usually attendant upon cases cared for in their homes by men unskilled in the obstetric art.

Varieties.—According to the degree of displacement, inversion of the uterus has been divided into three varieties. The first degree consists of a simple dipping-in or cupping of the fundus. The second degree consists of those instances in which the fundus descends below the *os uteri*. The third degree is made up of those instances in which the inversion is complete. This latter condition may be so exaggerated that the vagina is partly inverted with it, and the uterus drags down the tubes and ovaries, making a complete uterine inversion with prolapse.

Etiology.—Two or three factors are necessary for the production of this phenomena: pressure from above and traction from below, together with a localized atony or thinness of the uterine walls. Some of the exciting causes are the implantation of the placenta at the fundus, submucous fibroids (which have become pedunculated during pregnancy) and manual extraction of the placenta. The latter has been known to be an exciting factor in several instances, and is probably due to the negative pressure set up by removal of the hand from the uterus, together with a thinned fundal area and pressure of the hand from above. The weight of a large placenta, attached at the fundus, may be an exciting factor when associated with marked uterine atony; in instances of this kind, the fundus assumes a cup-shaped character and, as it descends, it becomes a foreign body. In the process of time, the remaining portion of the

organ becomes active in its contraction and endeavors to expel this depressed portion in exactly the same way, and for the same reason, that it did to expel the child.

Exceptional instances of spontaneous inversion have occurred as a result of intraabdominal pressure. Other causes include delivery with the mother in a standing posture; a short umbilical cord, or a cord shortened by being twisted about the child's neck or body; hard coughing, sneezing, etc., at the end of a long wearisome labor. The three most important causes, purposely placed last in this series are: first, too early adoption of the Credé method or its improper use; second, traction upon the cord; and third, a combination of the first and second causes.

We cannot escape the fact that the majority of inversions of the uterus are due to faulty technic. There are those rare instances in which inversion occurs two or three days after delivery in the care of competent well-trained obstetricians; but these are few. We are not interested in that class. But our interest is challenged in the ninety-nine cases which are directly traceable to poor technic in delivery.

J. M. Monro-Kerr(7), Glasgow, states that in making a review of English and Continental literature for the years of 1903–1905, twenty-three cases of inversion were reported and, in examining them, it was very evident that in the majority of them the occurrence had followed pressure from above, or traction from below, or both. Williams says that this accident is scarcely ever seen when labor is properly conducted.

Out of 100 cases, tabulated in a given series, only three were delivered in hospitals. These tabulations, however, are from large clinics where the technic of delivery is controlled by a single individual. It occurs to me that the injudicious use of large doses of pituitrin may be a predisposing etiologic factor.

Symptoms.—Inversion of the uterus is followed by alarming shock and hemorrhage, dependent upon the degree of inversion present—the more complete the inversion, the more profound the symptoms. The heart may be very seriously affected through reflex action. Hemorrhage is always a prominent symptom, and, in the recent case, demands immediate and effective attention. When the inverted uterus remains in the inverted position for a considerable time, the contraction ring, created by this re-duplication, may shut off the circulation sufficiently to cause gangrene of the portion lying beyond the contraction.

Diagnosis.—If the obstetrician is in attendance at the time inver-

sion takes place and when the inversion is sufficiently extensive to cause protrusion of the organ from the vulva with the placenta attached, the diagnosis is easy; but in instances where the inversion is incomplete, a very careful examination must be cautiously made. To this end, the bladder should be emptied first; for, should the inversion have existed for two or three hours, or more, there will be a marked retention of urine and a well-filled bladder might be mistaken for the fundus uteri. With this precaution, the patient anesthetized, one hand above the symphysis and the other in the vagina, the true pathology will be revealed.

Prognosis.—According to Crosse(8), one-third of the women having inversion of the uterus die either immediately or soon after the accident has occurred. Death may be the direct result of shock or hemorrhage; or, as is the rule, a combination of the two. When death does not follow immediately, many of these cases die of infection. All of these conditions prove that inversion of the uterus is one of the gravest of obstetrical accidents.

Treatment.—As regards prophylaxis, it cannot be too strongly emphasized, first, that the cord should not be dragged upon; second, that Crede's method of delivering the placenta should not be injudiciously practiced; third, that the fundus uteri should never be so pressed down upon as to cause indentation; fourth, that, in my opinion, it is of the greatest importance that Crede's method should never be employed, except when the uterus is in contraction; and fifth, that the obstetrician should remain with the patient until firm and permanent uterine contraction has been established.

The more recent the inversion of the uterus, the more surely and safely it can be reduced. In the twenty-three collected cases of Monro-Kerr's, referred to above, all were treated by competent obstetricians; yet in three cases the organ was not restored, and in four cases replacement was accomplished with difficulty. Therefore, it is evident that considerable patience and ample time are required in efforts at replacement of the inverted uterus. In instances where the uterus is open and flaccid, restoration can usually be made by introducing one hand into the vagina, with its closed fingers and thumb pressing upward on the most dependent portion of the displaced organ and, with the other hand upon the suprapubic region, giving such assistance as the pressure from below would indicate. In the latter case, where some time has elapsed between the accident and attempts at replacement, Bandl's ring will often be found firmly contracted and this is the greatest obstacle to be overcome. Considerable time, with the use of gentle force in the

efforts at reduction, will usually be productive of good results. If we attempt this maneuver too hastily, rupture of the uterus may be caused by the hand within the vagina. Time, gentle force, and patience will, as a rule, tire out the muscles forming Bandl's ring, and permit the desired restoration of the inverted organ.

In rare instances, these manipulations can be carried out without the aid of an anesthetic on account of the existing shock having obtunded the patient's sensibilities; but, in the general run of cases, full surgical anesthesia with patient in the partial Trendelenburg position will be necessary to secure the desired result.

The best authorities differ in opinion as to whether the portion of the uterus first inverted should be the first, or the last, to be replaced. It seems that this would depend, principally, upon the time elapsing between the accident and attempts at replacement. In cases where the placenta remains attached, and when it is possible to replace both placenta and uterus together, this method should be followed.

When only parts of the placenta remain attached, they should be removed, the area well disinfected and the uterus replaced as just described. When the uterus has been in a state of subacute inversion and considerable involution has taken place, adhesions will have been formed sufficient to make the manipulations referred to inapplicable and impossible. When the obstetrician is confronted with cases of this kind, some type of radical operative intervention becomes necessary.

Kuestner's operation for the relief of this condition consists in opening Douglas' pouch, inserting the left index finger through the opening, and then into the cup-shaped inverted uterine fundus. If the fundus of the uterus be outside of the vulva, the inverted portion will appear uppermost and, therefore, easily accessible to the operator. A longitudinal incision in the medium line, dividing the cervix at the inverted ring, is carried up through the body of the uterus to the fundus. With the freedom of structures thus obtained, the organ is easily re-inverted and restored to its normal position by the finger remaining in the cup-shaped portion, while the thumb pushes the fundus upward. The fundus is now drawn through the posterior incision in Douglas' pouch, where the uterine wound is sewn together and the organ returned to the pelvic cavity.

Spinelli's operation is very similar and answers the same purpose; but the incision is made through the anterior vaginal wall transverse to the cervix. As in anterior colpotomy, the bladder is pushed up and, after admission to the pelvic cavity is gained, the other details are followed exactly as in the Kuestner operation.

Case Report.—On April 10, 1919, at 1 A. M., Mrs. C. B. gave birth spontaneously to a baby girl, at full term, after a moderate labor of ten hours' duration. The physician in charge, who referred the case to me, waited one hour for the delivery of the placenta; it refused to be born. He made pressure upon the uterus from above and traction upon the cord from below. This resulted in complete inversion of the uterus so that the fundus presented below the vulva. The patient was left in this condition until the following morning, when an attempt was made to reduce it. The effort was futile. The patient was allowed to remain at home nearly all of that day. At eight o'clock in the evening of April 11, she was sent to the hospital, where the writer first saw her. Thus a complete inversion had existed for twenty hours. The patient was a robust woman of the working class, and presented a ghastly appearance, caused by the severe shock and the uninterrupted loss of blood from the time the inversion took place. Temperature, 97.5°; pulse, 140; blood pressure, 110 systolic, and 90 diastolic. A blood count, made after she was in bed, showed 1,500,000 reds, hemoglobin, 40 per cent. It was evident she had bled to an alarming degree. This bleeding, coupled with severe shock, made the prognosis rather grave. However, the patient was placed upon the operating table, and ether administered to complete surgical anesthesia. Hypodermoclysis under the breasts was at once instituted. An examination revealed the inverted uterus between the patient's thighs. The placenta had been almost entirely removed. The entire endometrium was bathed with ethereal soap and sterile water; this was followed by a 2 per cent. solution of iodine. The patient was then placed in a partial Trendelenburg position, the obstetrician's left hand was inserted into the vagina and, with the fingers and thumb extended, the uterus was pushed up, care being taken that the force from below was made in the long axis of the pelvis, the hand above becoming of equal importance in its effort to replace the organ after the part below was pushed up above the fundus, where the right hand successfully assisted in drawing the uterus upward. The maneuver was similar to that which the hand assumes when milking a cow. About fifteen minutes of gentle manipulation succeeded in forcing the inverted fundus of the uterus through Bandl's ring, which was the chief obstacle to its replacement. Several pieces of iodoform gauze, 2 inches wide and 1 yard in length, were separately packed into the uterus and left in such a manner that they could be removed singly, beginning with the lowest piece, at the end of thirty-six hours, thus preventing a recurrence of the inversion of the uterus.

Very little ether was required. The patient was placed in bed, with her feet elevated, and was given the Murphy drip, consisting of tap water, soda bi-carbonate, and glucose. She remained in the hospital sixteen days. Her recovery was uneventful. A mild infection manifested itself, but disappeared after two or three days.

BIBLIOGRAPHY.

1. Jardine, quoted by Kerr, *Operative Obstetrics*, p. 6517.
2. Winckel, Lehrbuch der Geburtshülfe, 1893.
3. Beckman, *Zeitschr. f. Geb. u. Gyn.*, 1895, p. 271.
4. Madden, quoted by Williams, p. 847.
5. Jones, W. C., quoted by Graves, p. 482.
6. Kehrer, Handbuch der Geburtshülfe, 1889.
7. Kerr, Operative Midwifery, pp. 658-9.
8. Crosse, quoted from *American Text-book of Obstet.*, p. 150.

DISCUSSION.

Dr. Sylvester J. Goodman, Columbus, Ohio.—I want to report a case of inversion of the uterus, showing the remarkable ability of the patient to recover after having been badly handled. The patient was a young woman who, in the third stage of labor, was subjected to strong traction on the cord. Complete eversion resulted and when seen the uterus lay in the belly. In order to keep the uterus soft it was thoroughly anointed with lard found in a kitchen in the country and packed with cotton. But before cleansing the lard and other foreign material from the uterus as best we could, we painted it with dilute iodin, reduced the inversion, and she got well without a rise of temperature.

Dr. James E. Davis, Detroit, Michigan.—I want to cite briefly the history of one case that came under my care during the past year, a case where the inversion had been caused by pulling upon the cord. The case was first observed about twelve hours after the delivery of the placenta. At that time there was complete inversion of the uterus. The replacement was done by making pressure upon the softest portions of the inverted structure and after complete replacement had been accomplished under surgical anesthesia, two ampules of pituitrin were given. A period of twelve minutes was allowed to elapse, there was absolutely no contraction wave of the uterus produced by the pituitrin. After that two ampules of ergot were given, and within a period of four minutes a contraction wave beginning at the fundus of the uterus was very perceptible and continued with such efficiency that the hand was pushed down and out of the uterus.

Dr. Abraham J. Rongy, New York City.—All cases of inversion of the uterus, after successful replacement, in addition to packing, should be placed in the extreme Trendelenburg position to prevent recurrence of this condition.

Dr. Yates. This patient was placed in the Trendelenburg position.

CESAREAN SECTION; ITS INDICATIONS AND TECHNIC.

BY

ARTHUR J. SKEEL, M. D.,

Cleveland, Ohio.

In the earlier history of obstetrics, Cesarean section was almost equivalent to a death sentence to the mother. The operation was performed only when the mother's life was beyond hope, and for the purpose of saving the child; or when the type of obstruction was such as to render delivery by embryotomy impossible through the parturient canal.

With the introduction of asepsis, the maternal mortality of Cesarean section was so reduced (20–30 per cent.) that the operation was considered an alternative to embryotomy without, necessarily, sacrificing the life of the mother.

In those days Cesarean section for the absolute indication meant that delivery of the child, by embryotomy, was not possible, rendering the abdominal route absolutely imperative; or when delivery by embryotomy was possible, Cesarean was rendered elective, because with it both lives concerned might be saved.

With the introduction of the Saenger technic of Cesarean section, the maternal mortality was still further reduced, and the operation was selected in behalf of the child in cases of moderate pelvic obstruction. Pelvic measurements, particularly the diagonal and true conjugate diameters, were discussed in terms of half centimeters; and gradually the lesser grades of pelvic contraction were included within the limits indicative of elective Cesarean section.

Next came full recognition of the fact that most cases of fatal septic infection were caused by vaginal examinations and manipulations. This, with other refinements of technic, rubber gloves, and so forth, reduced the question of Cesarean section to two primary problems: 1. Can the child be safely delivered per vaginam? 2. What are the mother's chances to escape infection? At this period, the problem was, practically always, the amount of risk the mother should take to save a child whose life is endangered by some obstruction in the birth canal. This question is not always easily determined. The responsibility rests, principally, with the obstetrician. It is

for him to answer this question in each case, with his own conscience as a mentor.

Since January, 1914, the writer has personally performed fifty-three Cesarean sections in which the indications were as follows: Disproportion between the child and mother's pelvis, thirty-five; placenta previa, six; eclampsia, two; eclampsia and placenta previa, one; eclampsia and pelvic disproportion, four; miscellaneous, five.

The indications here given correspond with those of other recent writers, showing disproportion as the indication in the majority of cases, 66 per cent.; placenta previa and eclampsia each approximately 13 per cent.; miscellaneous, 8 per cent.

Cesarean Section for Disproportion.—The term disproportion implies simply that the passenger is too large for the passage. As the maternal and fetal mortality and morbidity of Cesarean section has been gradually lowered, the degree of disproportion justifying the operation has been considerably lessened. Whether a given degree of disproportion is an indication for hysterotomy is a matter for the judgment and experience of the obstetrician to determine. The latest broadening of our view in regard to narrow pelvis as an indication for Cesarean section was brought home to us by the pediatrist, who insists that many cases of mental deficiency are due to injury of the brain of the child during delivery.

To judge correctly, the obstetrician should consider carefully the size and shape of the pelvis; the size of the child; the degree of ossification of the head; primiparity and multiparity; an accurate history of previous labors; the patient's resistance, endurance, and muscle power. All of these must be carefully weighed before the obstetrician decides that disproportion exists in a given case. In addition to this, the presentation and position of the child, the character of available hospital facilities, and possibly a test of labor may have to be considered. If labor has begun, the risk of an already existing infection, based upon the following, should be carefully considered before judgment is rendered for or against the election of Cesarean section in all cases of contracted pelvis: (*a*) the duration of labor; (*b*) the condition of the cervix; (*c*) the time elapsed since the membranes ruptured; (*d*) the character of examinations, or previous unsuccessful attempts at delivery, and when, where, and by whom they were made. The decision should not be left to the tyro, nor to the general surgeon, nor to the family physician.

The author is accustomed to designate the degree of descent of the presenting part by the term *station*. If the largest participating circumference of the presenting part is above the brim, it is called

station 1; if it is in the brim, station 2; if it is below the brim, station 3. In a primipara with normal presentation and position if the head is at station 1, at the beginning of labor, the accoucheur may suspect a small pelvis; if at the end of four or five hours of brisk first stage labor pains, the head remains at station 1, a narrow or justo-minor pelvis is almost a certainty. In multipara the head may remain at station 1, until the end of the first stage of labor, without any disproportion between the child and the pelvis whatever.

The bimanual examination, with attempted manual engagement of the presenting head, and the testing for overlapping at the upper border of the pubes, gives valuable information to the expert obstetrician. Occipito-posterior positions render manual engagement more difficult, and the presence of the projecting brow in these cases is often interpreted, by the inexperienced, as indicative of disproportion.

The most difficult of all cases to diagnosticate definitely as to whether the disproportion demands operative intervention, is that of the primiparous woman with a moderately contracted pelvis and a breech presentation, because no direct comparison can be made between the head and the pelvic brim. In these cases the type of pelvis is of assistance in forming an opinion. The justo-minor type of pelvis is far less favorable for the delivery of the after-coming head than the simple flat variety.

In the writer's practice, in cases in which disproportion is suspected and the test of labor is to be given, all examinations are made per rectum until final judgment is to be rendered as to whether an operation is necessary; then one thorough, rigidly aseptic vaginal examination is made, under anesthesia, if there be need of it.

Cesarean Section for Placenta Previa.—The series presents seven cases of hysterotomy for placenta previa. Six of them were of the complete type, central or nearly so. The operation was performed to save the life of the baby. All mothers recovered and all babies lived. The other case was complicated by eclampsia. She was a primipara, thirty-six years of age, very desirous of having a baby. The family physician had taken care of her for six weeks, during which time she was suffering severely from toxemia. When she arrived near term, uterine hemorrhage began. The fetal heart could not be heard. An examination revealed a boggy mass, between the cervix and the presenting head, and extending over the entire vaginal vault. The cervix was unobliterated. Labor had not begun. The child was dead. Abdominal hysterotomy was

selected as the safest method of delivery for the benefit of the mother. She recovered.

The writer believes that in cases of complete placenta previa and a viable baby, Cesarean section is justifiable for the sake of the child, as well as in the interest of the mother. If considerable bleeding has occurred, transfusion may precede, or accompany the operation. The use of the tampon and dilating bags, followed by version and slow extraction of the child, furnishes a high fetal mortality, and does not always save the mother. Cesarean section saves the child, and reduces the maternal risk.

Cesarean Section for Eclampsia.—In the series of cases presented, there were seven abdominal hysterotomies performed for eclamptic toxemia. In only two of these cases was the eclampsia the sole indication for the operation. Four of the eclamptics were the victims of contracted pelvis; and one other was complicated by placenta previa.

If in a case of eclampsia it has been decided to empty the uterus before the method of procedure is determined, a study is made of, first, the condition of the cervix; second, of the size of the pelvis; and third, of the period of gestation, and the size of the fetus. The condition of the cervix is placed first, because it is of prime importance, for the reason that no case of eclampsia with an easily dilatable cervix should be subjected to abdominal section, unless it is complicated by some other bar to vaginal delivery. On the other hand, if a given case of eclampsia with a *long and rigid cervix* is to be delivered, it matters little whether the symptom, convulsions, has appeared or not, the abdominal route should be selected for the delivery of the child. Rest is a prime factor in the treatment of eclampsia, and the long painful hours of labor, necessary to deliver such a case, vaginally, will often prove fatal to the mother.

The writer lost a patient of this kind one year ago. She was a forty-two-year-old primipara, with a severe toxemia, a partially compensated heart lesion, and a long, hard, unobliterated cervix. The patient's brother, a physician, rather objected to Cesarean section, because no convulsions had occurred. Induction of labor was undertaken, convulsions began under the strain of a long first stage of labor, and the death of the woman was the result. I am sure this patient would have had a better chance for life had a prompt Cesarean section been performed under morphine and gas. The condition of the cervix is worthy of more consideration than the presence of convulsions, when we select the route of delivery in an eclamptic. In deciding whether to perform a Cesarean section

for eclampsia with contracted pelvis, the obstetrician must again consider the maturity of the child. He must not lose sight of the fact that the child of a mother, long toxic, will be smaller than that of a normal mother at any given period of pregnancy.

Technic.—Forty-eight of the cases were operated upon in my home hospital where I have control of the technic. Five of them were in other hospitals where the technic was not amenable to my direction. There were no deaths and no infected incisions among the forty-eight cases in our own operating room. There were one maternal death and one sloughing wound among the five cases in other hospitals. Whether the difference was due entirely to faulty operating-room technic is, of course, impossible to prove. There can be no doubt, however, that, in many small hospitals without a well-organized surgical staff, the facilities are so poor that one must question his right to subject a patient to this uncertain factor. Even when one is operating in a well-equipped but strange hospital, the old rule, "Every dog barks best on his own door step," applies particularly well here. Strange assistants, strange nurses, strange surroundings, all tend to produce a certain lack of unity of action, so that the operator can neither give nor receive as effective service. This factor, too, should be given careful consideration in deciding for or against Cesarean section. The patient's chance for recovery is surely affected by it.

Our preference is to operate after labor has set in. The cervical dilatation thus secured permits freer drainage, less operative pain, less vigorous uterine contraction, and less disturbance in the uterine wound. The abdomen is shaved, scrubbed with green soap and sterile water, dried, then washed with 95 per cent. alcohol, followed by Harrington's solution, and this again with alcohol. We employ either the high or median incision. In the latter cases a mid-line incision, with the navel in its center, has, been used. We do not know of any good surgical reason why the navel should constitute a landmark below which the incision should not extend. The umbilicus is usually excised to secure a more even suture line.

The classic extraperitoneal Cesarean section may have some advantages; but, judging from the literature, and the few cases the writer has seen, there is so much chance of tearing the peritoneum that it seems to offer little security against entering the peritoneal cavity.

The low transperitoneal Cesarean section operation, so much lauded as protecting the peritoneal cavity by suturing, is a true

intraperitoneal operation so far as postoperative peritonitis is concerned.

Peritonitis following Cesarean section is acknowledged to be wound infection. On post-mortem examination, and on opening the wound for drainage, the infection can be readily traced from the interior of the uterine cavity, through the incision, and along the suture lines.

Careful stitching of the abdominal to the uterine peritoneum; overlapping of the layers of peritoneum; the making of the abdominal incision and uterine incision at right angles to each other; all leave behind the same condition when the operation is completed; namely, incisions with suture lines at some place connecting the interior of the uterus with the peritoneal cavity.

The writer believes that the improved results from the low incision are due to the well-known greater resistance of the pelvis peritoneum; and, as De Lee well states, to the lesser degree of disturbance from uterine contraction in the lower uterine segment.

The writer must protest against the argument that the low operation, requiring a greater degree of technical skill, is better because unskilled operators will be deterred from attempting it. We have not yet reached the point where we must camouflage an operation, making it appear more difficult, in order to prevent the tyro from performing this operation. Simple technic, where possible, is the best. In the future, we expect to do the median operation on clean cases, and the simple low operation on doubtful cases or on cases where there is a suspicion of infection; but we do expect to sew infection out of the peritoneum by any refinement of technic.

After the abdomen is opened, the hand is passed about the uterus to ascertain its freedom from pathological conditions, and its midline is drawn to the line of the abdominal incision. Wet towels are used instead of sponges to wall off the cavity. The uterine incision is made down to the membranes and enlarged with the scissors or finger. The hand is used to separate the membranes freely before rupturing them. If the placenta is first encountered, it is quickly incised. The fetus is extracted and passed to an assistant after cutting the cord. Neither ergot nor pituitrin is given until the child is removed from the uterus, as we have several times experienced difficulty in extracting the head because of too early vigorous uterine contraction caused by these drugs. The fingers of an assistant, hooked in the upper angle of the uterine wound, make traction and eventrate the uterus immediately after the child is delivered Pituitrin, 1 c.c., is now given, hypodermically directly into the uter-

ine walls, and an ampoule of ergot is injected in the thigh. The placenta and membranes may now be rapidly stripped off, and easily lifted from the uterine cavity.

Two layers of continuous sutures of No. 2 chromic gut are used for the muscle wall of the uterus. At each stroke the needle passes obliquely downward and inward. Although not locked, the sutures readily control bleeding. Care is taken to secure well the upper and lower angles of the uterine wound. The serous coat of the uterus is closed with plain catgut The Lambert suture is employed for this purpose. This suture is made to include the superficial muscle fibers. The abdominal incision is closed as usual, with the addition of three stay sutures of silkworm gut.

To relieve pain, morphine is given freely during the first thirty-six hours. The child usually is admitted to the breast after twenty-four hours. Gastric dilatation is treated by pituitrin and lavage; simple intestinal distention is relieved by pituitrin and insertion of the rectal tube. Gas is our anesthetic. Ether is added if more complete relaxation is desired.

Repeated Cesarean Section.—When a patient has had one Cesarean section for disproportion between passage and passenger, the writer believes that the abdominal route should be chosen in subsequent deliveries. If the first Cesarean section was performed for any other reason except disproportion, the woman should be taken to the hospital when near term, and kept under competent supervision; and there, the method of delivery may be selected as circumstances may indicate.

Repeated Cesarean section is by no means so simple an operation as the first one. As a rule, adhesions are found to exist. Of the six cases of the above series, numerous adhesions were present in five instances, and absent only in one. The densest adhesions consisting of omentum and bowel, were invariably at the upper end of the abdominal scar. The abdominal incision, for the second Cesarean section operation, is best made lower down than the first, and to one side of it. The peritoneum should be opened first at the lower angle of the incision. In this manner, one usually enters the free peritoneal cavity at once, and adhesions may be dealt with advantageously. It has been the writer's practice to free the uterus thoroughly, but to leave adhesions to the abdominal wall alone. If they presented no special reason for interference.

In five of the six cases reported, the uterine scar was firm and discernible with difficulty; often it could be recognized only during a contraction. In one case the scar was thinned out in its lower

portion and might have ruptured had the women been allowed to deliver herself. The previous operation was performed by the writer, and with his usual technic. The puerperium was normal. She had been in labor for forty hours however, thus presenting one of the known causes for imperfect union of the uterine wall. The uterus was not adherent to the abdominal scar in any of our cases.

Of the fifty-three cases of the above series, thirty-eight had been in labor less than ten hours; fifteen, longer than ten hours; six, twenty-four to forty hours; five were sent to the hospital by the family physician after prolonged labors; and, of course, numerous vaginal examinations. In some instances repeated attempts at delivery had been made; four cases had been tamponed at home to arrest bleeding; eight had been the victims of decidedly poor management.

The single death recorded occurred in a patient with contracted pelvis. The membranes had ruptured four days before I saw her; numerous vaginal examinations had been made, but no attempt at delivery. She lived fifty miles from my office, and the post-operative care was, necessarily, left to the family physician. He reported that the temperature began to rise on the second day; that eclamptic convulsions developed, and she died on the fourth day after the operation.

All of the babies lived, except in the two instances in which the fetus was known, or suspected, to be dead.

DISCUSSION ON THE PAPER OF DR. ARTHUR J. SKEEL.

Dr. Irving W. Potter, Buffalo, New York.—My experience with Cesarean section covers 360 cases, and I cannot agree with what Dr. Skeel has said relative to following the second or third Cesarean operation, because in the majority of cases we found it easy. In somes cases, where you have done a second or third Cesarean operation, we do not find it easy. We find sometimes, but not often, a loop of omentum attached to the uterine scar, but no adhesions of the bowel or anything that gives serious trouble. This is due to the fact that we are particularly careful in closing the uterine peritoneum over the incision. We get a Cushing suture down there which brings it over like a cover, and we do not have trouble. I follow the high operation, that is, above the navel.

There is one point that I learned in Chicago from Fitzpatrick, who called my attention to it, and that is, that in some cases it is well to pack the uterus with gauze, and I put sometimes as much as six yards of iodoform gauze in the uterus, especially in cases where the cervix is long and thick. You can often leave the gauze in five days without trouble, and sometimes you take it out in the

second twenty-four hours; you can establish good drainage by doing this.

Dr. John W. Poucher, Poughkeepsie, New York.—I have in the last ten or twelve years done on an average five or six Cesarean sections a year. None of these were my own obstetrical cases because I do general abdominal surgery and practically no obstetrics. My experience is not like that of Dr. Skeel's, but it has been more like that of Dr. Potter.

Of my series during the past twelve years of 61 cases, I have 7 second and 2 third Cesarean operations, and in not one of these did I encounter adhesions. I believe adhesions are avoided by making the incision high up, so that the contracted uterus passes down into the pelvis below the other wound. I have a way, with flabby, large abdominal peritoneums, of taking it up by whips on either side and holding it up by putting the sutures deep in the peritoneum with a lock stitch. None of the incised peritoneal surface comes in contact with the omentum or the intestine. I have never seen either adhesions to the abdominal wound or to the uterine wound. In fact, in several of these cases it was almost impossible to detect the line of incision in the uterine wall.

One thing I want to mention is the question I heard asked at one of the meetings of this Association several years ago, namely, why is it that Cesarean section babies are more difficult of resuscitation than babies born normally? I think I know why. Shortly after that time I had occasion to operate upon a woman who had been under the influence of morphin for over sixty hours. After delivery the infant was so doped that although it breathed readily, as soon as it was left alone respiration stopped, and, apparently, it did not breathe again. The attending physician took entire charge of the child and worked over it for an hour. Finally the child succumbed. He was unable to resuscitate it. The condition of the child had every appearance of it being due to the morphin given the mother.

Up to that time it had been my custom to give my Cesarean patients the same preliminary hypodermic of morphin as for other operations, but since then I have omitted it and every baby has cried as soon as delivered, except in one case and that was where the attending physician had given our patient half a grain of morphin to prevent a recurrence of eclamptic convulsions while taking her to the hospital, and here we had the same doped condition of the baby.

Dr. Abraham J. Rongy, New York City.—I want to emphasize the fact that when doing Cesarean section on a woman who had previously been subjected to the same operation, we must be careful in entering the peritoneal cavity. My experience with this operation during the past ten years has been confined to one hundred and twenty cases. A great number of these were second Cesarean operations and several in whom Cesarean was performed for the third time. The last Cesarean which I did about three weeks ago was on a woman who had had a Cesarean section performed by another surgeon. I attempted to open the abdomen in the usual manner, on

the side of the old scar, making a sweeping incision. To my surprise, on entering the abdominal cavity, I found that my incision had caught a coil of small intestine which was adherent to the posterior part of the abdominal wall, transversely. I was immediately confronted with a piece of intestine that was cut completely across. I anastomosed the gut and continued with the Cesarean and, fortunately for the woman, she had an uneventful recovery, and was discharged subsequently from the hospital.

In many cases where women have been in labor for 24 hours or over, and in whom there is an existing disproportion between mother and child, and in whom the cervix is dilated, with repeated vaginal examinations, I believe that Cesarean section is not the ideal operation. With these indications pubiotomy may be readily performed with safety to mother and baby. I would like to say right here that pubiotomy, as far as I am concerned, and I have done it fourteen times, should only be performed in cases in which we presuppose infection, and I take this opportunity to take exception to a brilliant article appearing in Surgery, Gynecology and Obstetrics, by Dr. Henry Jellett, of the Rotunda hospital, Dublin, Ireland, about a month ago. The author in his article advocates elective pubiotomy for sterility with a flat pelvis. To operate on a woman for sterility and at the same time perform pubiotomy for contracted pelvis is, in my opinion, a very questionable procedure, for we are first of all not assured that such a woman will become pregnant.

Dr. Skeel has had a low mortality in his series of cases, much lower than that in a large number of cases, and his indications are very well placed.

Dr. Asa B. Davis, New York City.—I am not able to improve very much upon the statements made by Dr. Skeel in his paper. The indications as he found them are the same as those I have been accustomed to find.

A number of years ago Dr. Cragin reported from Sloane disproportion due to Contracted pelvis as an indication for Cesarean section in 79 per cent. of his cases; at about the same time I found it to be 81 per cent. in the Lying-In Hospital. Our experience does not differ from other operators in that a considerable number of cases are first seen and offered for Cesarean delivery after they have been long in labor; some with membranes ruptured and a history of few vaginal examinations having been made; others with membranes intact and yet having been subjected to many vaginal examinations. I have come to look upon the former class as much the greater risk for Cesarean delivery. In repeated Cesarean sections we are apt to find omental adhesions about the abdominal opening —by no means in all of the cases. It is rare to find uterine adhesions. I believe this result is due largely to the high abdominal incision. That is one reason which induced me to carry the abdominal incision entirely above the umbilicus. I have kept to the midline because I dislike to divide muscles where it can be avoided. At full-term pregnancy there are no muscles in the midline of the abdomen. By this method the uterine wound and the abdominal

wound cannot possibly come into contact. In our early experience we did see extensive adhesions between these two wounds, after using the incision below the umbilicus. One case which I was able to follow for some time had the uterus firmly adherent to the anterior abdominal wall with a sinus leading through the abdominal wall into the uterus. In my first case I followed the Sawyer technic. The uterus was firmly adherent to and retracted the anterior abdominal wall. For several years the patient experienced great pain from this cause. It gradually disappeared. I think one rule to lay down in order to prevent adhesions following Cesarean section is that manipulations inside the peritoneal cavity should be reduced to the minimum. Not infrequently we are able to operate without any of the abdominal contents coming into view except the anterior wall of the uterus. Occasionally I operate without using any abdominal pads—rarely with more than two pads wet in warm salt solution and placed above the fundus. As Dr. Skeel has stated, the final closure of the uterus is by the Lembert or Cushing stitch, thus leaving no raw surface exposed in the uterine wound. Packing the uterus in order to facilitate drainage was mentioned. Such packing may act as a drain for about five minutes. Then it becomes filled with clots and by uterine contraction it is forced down into the cervix and acts as a plug. I have known of one fatal case due to a deep uterine suture being caught in uterine packing. When the packing was removed the suture was pulled out, allowing leakage into the peritoneal cavity. I know that packing the uterus for drainage is unnecessary, and I believe it to be harmful.

In recent years, in a certain type of suspected septic cases, I have followed the teachings of Dr. Ill and packed the uterus with gauze saturated with 25 per cent. alcohol, with good results.

Dr. Skeel (closing the discussion).—I may state that when I referred to adhesions I did not mean adhesions of the uterus to the abdominal wall but adhesions of omentum. Not all of these cases were those in which I had done the first operation. I cannot say that the first cesarean section simplifies the second one. Adhesions do occur in a great many cases.

In regard to what Dr. Rongy has said about making a second incision, I make it lateral to the first and go through the peritoneum at the lower end of the incision first. In every one of my cases where I found adhesions they have been in the upper angle of the wound, not only in median operations, but those high up.

With regard to the resuscitation of babies, there is no difficulty whatever unless you fill the patient full of morphin before operation. If this is not done you will not have difficulty with the babies breathing.

These cases come to us from the hands of the family physician. The obstetrician, and not the surgeon, must decide what is to be done with them. The obstetrician is the only man capable of judging of what must be done in these cases, and what the indications are. The obstetrician should be the surgeon, not the surgeon the obstetrician.

HOT FLASHES OF MENOPAUSE.

THE VEGETATIVE, NERVOUS, AND ENDOCRINE SYSTEMS AS FACTORS OF MENOPAUSE DISTURBANCES.

BY

K. I. SANES, M. D.,

Pittsburgh, Pa.

THE wide range of menopause symptoms—vascular, nervous, and visceral—and their temporary but universal appearance after the cessation of ovarian function, suggest the probability that menopause is a manifestation of disturbances of the vegetative nervous system brought about by the changed endocrine correlationships resulting from the disappearance of the ovarian hormones.

The explanation of hot flashes, a sudden sensation of heat accompanied by cutaneous vascular dilatation, must be looked for in these disturbances. As great advances have been made in recent years in our knowledge of endocrinology and the vegetative nervous system, it may not be out of place to discuss them briefly before taking up the subject of our paper.

THE VEGETATIVE NERVOUS SYSTEM.

The vegetative nervous system is, to a great extent, independent of the central nervous system. It was shown by experiments of Goltz and Ewald(1) that animals in whom a part of the spinal cord had been removed, continued to live, digesting, voiding, and developing. The vegetative nervous system supplies all the smooth muscles, the heart, and all the secretory glands of the body; that is, every structure that does not belong to the voluntary system. It consists of a sympathetic division arising from the thoracic and lumbar segments of the cord (its three cerv cal ganglia communicating with the cervical nerves)[1] and the parasympathetic division

[1] The sympathetic nervous system consists of vertebral, prevertebral, and terminal ganglia, and sympathetic fibers with their numerous plexuses. The vertebral ganglia (the paired sympathetic trunks) on the anterior surface of the vertebral column are arranged segmentally with the spinal nerves, with the exception of the three cervical ganglia. The internal carotid nerve, a branch

arising from the midbrain, medulla oblongata, and the sacral segments.[1]

The distribution of the vegetative nervous system is very extensive. Some of the structures are supplied, as far as we know

of the superior cervical ganglion, represents the direct continuation of the sympathetic trunks to the head, and, through the branches of the plexuses, communicates with the cerebral nerves and the plexuses of the head. Through the jugular nerve this ganglion is connected also with the jugular ganglion of the vagus. The prevertebral ganglia are situated irregularly at a distance from the spinal column, and the terminal ganglia are located in or on the visceral structures. The ganglia are masses of motor nerve cells which, together with the non-medullated fibers originating from them, constitute the motor neurons of the sympathetic nervous system. The sympathetic nervous system is connected with the spinal cord by means of white rami communicantes, the fibers of which originate in cells of the lateral horn of the cord and proceed as medullated fibers to the sympathetic ganglia, where they terminate around the cells that give origin to the sympathetic nonmedullated fibers. The function of rami communicantes is to carry impulses brought to their respective segments of the spinal cord for the ganglia with which they are connected. Aside from these fibers the connecting rami contain medullated fibers of the sympathetic afferent nerves. These fibers have their nutrient centers in the posterior root ganglia and carry impulses from the structures supplied by the sympathetic system. The nonmedullated fibers which arise from the motor cells of lateral ganglia pass backward to the spinal nerves (forming the gray rami) to be distributed segmentally with them to the skeletal and spinal vessels and to the subdermal structures pilomotors and sweat glands). The nonmedullated fibers that arise from the prevertebral and terminal ganglia supply the vascular system, smooth muscles, and glands of the viscera.

[1] The parasympathetic division, as we mentioned above, consists of a sacral and cranio-bulbar outflow. The sacral medullary nerves pass out of the sacral segment of the cord through the second and third sacral pelvic nerve (nervus erigens) and proceed directly to ganglia situated on the pelvic organs they innervate. The cranio-bulbar parasympathetic nerves, like the sacral, have their ganglia near or within the organ they supply. The parasympathetic fibers from the midbrain are carried by the third nerve and supply some of the eye muscles. The fibers from the medulla are carried by the seventh supplying the sublingual and submaxillary glands and the mucous membrane of the nose, mouth and pharynx and the fibers of the ninth supplying the parotid gland. The nerve supply of the vagus is very extensive. There are three nuclei of the vagus; nucleus ambiguous-motor, nucleus solitarius-sensory, and nucelus dorsalis-visceral. The fibers of all these three nuclei pass through two ganglia, jugular and nodosum. The first has spinal and sympathetic cells, the latter only spinal (Higier). We wish to call attention here, first, to the close relationship existing through connecting fibers between the sensory and motor nuclei of the vagus, which explains the mutual reflexes of the visceral organs supplied by these nerves; and second, to the intercommunication between the cranial parasympathetic nerves and the trigeminal, which accounts for the reflexes between organs innervated by these nerves, the trigeminus bearing the same relation to the parasympathetic system that the spinal sensory nerves bear to the sympathetic system.

by only one division of the vegetative nervous system. Most of them, however, are supplied by both, and in such structures one supplies the activating, and the other the inhibitory nerves.

Of the organs innervated by one division, the subdermal structures (pilomotors and sweat glands), the vascular system, and most of the genito-urinary organs are supplied by the sympathetic division; the cardiac end of the stomach, the esophagus, and the ciliary muscle of the eye by the parasympathetic. Of the organs supplied by both divisions, the ones that are activated by the sympathetic and inhibited by the parasympathetic are the heart, the trigone, and the following sphincters; the pyloric, cardiac ilio-cecal, anal, and vesical; the ones that receive the inhibitory fibers from the sympathetic and the activating from the parasympathetic are the pupil, the lachrymal and salivary glands, the body of the bladder, the smooth muscles, the glands of the gastro-intestinal tract, the liver, gall-bladder, and pancreas, with their ducts.

VASOMOTOR SYSTEM.

The vasomotor system, its nerves and centers, constitute a part of the vegetative nervous system. The vasomotor nerves are the vegetative nonmedullated motor fibers that innervate all the blood-vessels. They terminate in their muscular wall at the myoneural junction[1] and act either as vasoconstrictors or vasodilators. Whether vasoconstriction and vasodilation are obtained chiefly by the action of one set of vasomotor nerves or by the action of two sets of different nerves, is still a disputed question. We do know, however, that most, if not all, of the vasoconstrictors belong to the sympathetic division of the vegetative nervous system, the ones arising from the vertebral ganglia supplying the spinal and skeletal vessels, and those emerging from the prevertebral supplying the visceral. We are not so clear about the vasodilators. True, some of them were definitely traced both in sympathetic and parasympathetic systems;[2]

[1] According to Rudzki Hornowski's(2) diagram on the work of Ranvier, Schiff, and Gianuzzi, there is in the adventitia of the vascular wall a layer of ganglionic cells from which fine fibers pass to the plexus in the media. The fibers of the plexus terminate in the elastic radiate muscle of Dürck, or in the intima. The discovery of Kieth(3) that in the Australian echidna there is a true and direct union between the nerve and muscle fiber in the sinoauricular node, is very interesting in this connection.

[2] Some vasodilators have been traced some time ago, such as the chorda tympani of the VIIth cranial nerve, the small petrosal of the IXth, the lingual of the Vth and the nervus erigens of the sacral plexus. Later vasodilators were found in the entire mesenteric circulation controlled as far as the descending colon by

but whether they form a complete unit is not known. There are then vasoconstrictors and vasodilators. They change the caliber of the vessels in accordance with the need of the structures they innervate. These changes are accomplished, of course, through reflexes. For reflexes afferent nerves and centers are necessary.

Afferent nerves have been found coming from blood-vessels, their function being to prevent an undue filling and distention of the vessels. They are medullary fibers (sensory?) with their nutrient cells in the ganglia of the posterior roots. They carry the stimuli from within the wall of vessels to the centers.

Our knowledge about the vasomotor centers is not definite. A vasocortical center is believed to be situated in the Hypothalamus.[1] Such a center is necessary at least for the sudden vascular reflexes that accompany psychical emotions (blush, etc.).

There is a consensus of opinion as to the presence of a center or centers in the medulla controlling through the subsidiary spinal centers the activities of the vasomotor nerves.[2] There is a disagreement, however, as to the character of this center or centers. Most of the physiologists seem to consider it or them, as vasoconstrictor.

Bayliss believes that the bulbar center consists of a constrictor and dilator part, the afferent depressor nerves acting in an inhibitory manner on the former, and in an exciting manner on the latter, while the pressor nerves act in an opposite way on both Luciani.(12) Tschermak(13) placed definitely in the nucleus dorsalis of the vagus a vasodilator center, the stimulation of which causes the dilatation

---

the splanchnics. (Francois Frank & Hallion);(4) in the vessels of the kidney from the splanchnics, (Bradford)(5); in the vessels of skeletal muscles,(Gaskell)(6); in the aorta (the very important depressor nerve) from the vagus (Ludwig & Cyon)(7); in the cerebral vessels from the cervical sympathetic (Weber)(8); in the vessels of the limbs from the Vth and VIIIth thoracic and lumbar of the spinal nerves (Stricker)(9); in the vessels of the bucco-facial region, of the mouth, nose and facial skin from cervical sympathetic (Dastre and Morat) (10).

[1] Vegetative nerve tracts controlling visceral activities are believed to extend into the brain as far up as the third ventricle. Trophic and metabolic disturbances which have hitherto been ascribed to dyspituitarism may also have their origin in a disturbance of the hypothalamus. This possibly acts as a regulating center for glands of internal secretion and for the vasomotors of the brain. (Higier).

[2] The upper limit of the center is 1–2 mm. below the Corpora quadrigemina and the lower limit 4 mm. above the point of the Calamus scriptorius; it is anucleus of gray matter in a small prismatic space in each half of the bulb. (Ditmar.)(11)

of the visceral vessels and the constriction of the peripheral ones. While the centers mentioned have not been definitely demonstrated, there can be no question as to the existence of centers controlling the constriction and dilatation of vessels.

Not all the impulses carried by afferent nerves reach these centers. Stimuli carried by afferent (vasomotor) nerves, if adequate, reach the ganglion of the posterior root, and after entering the cord may be reflected in the lateral horn of the respective segment. The reflexes are then carried either through the vertebral ganglia to the skeletal vessels, or through the prevertebral ganglia to the respective visceral vessels. The same may be true of impulses carried by the afferent spinal (sensory) nerves. These reflexes usually take place in a segmental manner, but they may be reflected in a segment at a distance from the one that received the stimulus; and may even, if adequate, be carried up to the bulbar centers.

Such impulses are then reflected in regions distant from the one that originated the stimulus. Some of the stimuli, however, are insufficiently adequate to reach the spinal or bulbar centers. The reflexes then may take place within the vertebral, prevertebral, or terminal ganglia from which the structure originating the stimulus receives the nonmedullated vasomotor fibers. Whether a vasomotor reflex can take place from an afferent to an efferent vasomotor nerve in the same blood-vessel through the peripheral ganglia is a disputed question.

The reflexes described thus explain the antagonistic action between the superficial and visceral vasomotor Heidenhain,(14) the vascular reactions in regions remote from the stimulus the response of the splanchnic to spinal sensory stimulation, etc.

As we see, our knowledge of the vasomotor system is not complete. In general, however, we may say that the afferent nerves report the stimuli to the center. The more adequate the stimulus, the higher it is carried. Afferent constrictors, in all probability, carry impulses to a constrictor center to be reflected along vaso-constrictors; afferent dilators to a dilator center or possibly to a general vasomotor center inducing in it dilator reflexes along vasodilator nerves. How these efferent vasomotor nerves induce constriction or dilatation is not definitely known. According to Luciani,(15) the dilatation and constriction of the blood-vessels are accomplished through changes in the arrangement of sarcoplasm in the spindle-shaped muscle cells, the dilatation of the blood-vessels being brought about by shortening and the constriction by lengthening of the sarcoplasm in these cells. These spindle cells are supplied by afferent

medullary (sensory?) and efferent nonmedullary vasomotor fibers. the first carrying stimuli centralward, the latter carrying the reflexes peripheralward through vasodilators and vasoconstrictors.

PSYCHIC REFLEXES.

At this point we may say a few words about psychic influences in connection with the vasomotor system. There are psychic reflexes that possibly come from the vasocortical centers. There is no question about the intense reaction which blood-vessels may show to stimuli of cerebral origin. Emotions such as joy and shame cause blushing, fright, and anger-pallor of the face. Some of the psychic reflexes involve such large areas, as the splanchnics. We know, for instance, that unpleasant emotions induce dilatation of the splanchnic area, while pleasant ones cause constriction.

CHEMICAL INFLUENCES ON VASOMOTOR ACTIVITIES.

There are chemical substances in the body that influence the caliber of blood-vessels. In fact, in the human embryo, and especially in the lowest forms of life, chemical action almost entirely replaces the nervous activities. In higher forms of life the products of metabolism play a great rôle in the vascular system. We learn, for instance, that lactic acid is found during, and is produced by, the activities of the voluntary muscles, and that these "acid metabolites" cause vasodilatation. Schwartz and Lemberger(16) showed that a very small amount of acid in the blood gives rise to vasodilatation. These authors assert that the diabetic acidosis, as well as the acidosis of fevers, account for the erythema so frequently noticed in these conditions. The same is claimed for carbon dioxide, the almost universal product of metabolism. A diminished alkalinity of blood from any cause brings about a stimulation of the sympathetics and therefore favors vasoconstriction. According to Kretchner and Kleisel (17), such a condition is found in sympathicotonics. The most important chemical agents that influence the vasomotor activities are the secretions of the endocrine glands, and the most important of these glands are the ones in which chromaffin substances are found. The medulla of the adrenals is the largest chromaffin organ. The chromaffin cells of the adrenals and the sympathetic ganglionic motor cells are embryologically related.[1]

[1] The chromaffin cells are derived from the phaeochromeblasts, one of the two groups into which the primary sympathetic cells which migrate from the sympathetic nervous system becomes differentiated (the other group being sympathoblasts) (Bailey & Miller) (18). The relation of the adrenal medulla to the

The chromaffin cells influence the caliber of blood-vessels in the same manner as the sympathetic system. Their secretion, adrenalin, acts upon the vascular walls at their myoneural junctions, although in the quantities usually discharged into the circulation, adrenalin, contrary to the general belief, has not in normal states much influence on the blood-vessels.[1]

Hoskins states that the action of adrenalin on the circulation occurs only in time of stress. At any other time it is changed *in situ* to an inert form and discharged (21). Whether adrenalin acts continuously or only in times of stress, it must be considered in either case an important factor in the climacteric vasomotor disturbances, because menopause unquestionably *is* a "time of stress."[2]

In this connection one should bear in mind that chromaffin cells are found in a number of organs, and that the posterior lobe of the pituitary gland has an internal secretion with a vasoconstrictor action.[3] The vasoconstriction of the posterior pituitary gland, however, is somewhat different from that of adrenalin: it acts on the vascular muscle itself, and not on the nerve endings, as does the adrenal. Biedl (25).

THE OVARIAN INTERNAL SECRETION.

We thus traced the vasomotor nerve supply to its final destination; we called attention to the presence and mechanism of vasodilators; we spoke about the importance of the psychic and chemical influences on the vasomotor system. Now the question arises how does the cessation of ovarian activities bring about the vasomotor disturbances? Here we meet difficulties again. We are not even certain what part or parts of the ovary are responsible for the internal secretion. There are three, or possibly more, definite struc-

sympathetic nervous system is best seen, however, in its nerve supply. The cells of the medulla are directly connected with the spinal cord by sympathetic medullated fibers running directly to it without any ganglionic interruption.

[1] Cannon and Lymon(19) demonstrated that these doses of adrenalin are followed by a fall in blood pressure in a majority of cases. According to Hartman(20) this fall is due to the active dilatation of the skeletal muscles that accompanies the active constriction of the blood-vessels in the splanchnic areas.

[2] The vasomotor action of the chromaffin tissue is chiefly constrictor. The chromaffin tissue in the adrenal medulla acts in a stimulating manner in the vasomotor nerves of the sympathetic nervous system. Lohman(22) obtained Cholin from the adrenal cortex which acts as a toning agent on the parasympathetic nerves. Gautrelet(23) considers the cholinogenous system an antagonistic regulator against the chromaffin system.

[3] Gley(24) claims that the pituitary has chromaffin cells to which its vasoconstrictor action is due.

tures in the functioning ovary, each of which is claimed by its sponsors to have an endocrine action; the corpus luteum, the Graafian follicle, and the interstitial gland. The corpus luteum is the best known. It is formed from ruptured Graafian follicles; from what particular part is not definitely settled. It is claimed that the function of the corpus luteum is to supply a nutritional impulse of a cyclic nature to the uterus (Frankel) (26), to provide for nidation and subsequent development of the fertilized ovum in the uterus, and to inhibit ovarian activity during pregnancies.[1] If this assumption is correct, such a function does not necessarily speak for a hormone with extrasexual influences, for its action is local. If, on the other hand, we accept Leopold and Ravano's(27) conclusions that menstruation depends on the presence of the ovaries and uterine mucosa, and not upon the bursting of the Graafian follicle, then we have in the corpus luteum an endocrine gland that cannot produce any more constitutional disturbances in woman passing through menopause than in a sterile female during the period of her menstrual life.

The internal secretion of extrasexual importance, then, must be looked for in the other parts of the ovary, in all probability in the so-called interstitial gland of the ovary. It resembles according to some authors (Mulon, Wallart, and others)(28) the cells of the suprarenal cortex,[2] and is derived from the oogonia. The interstitial gland rapidly develops before puberty; a striking increase in its structure is also noticed during menstruation and pregnancy (during pregnancy extensive cystic changes are noticed in interstitial cells). During menopause it ceases to develop, but a remnant, persists for some time afterward. Limon(30) attributes to the interstitial gland an internal secretory function, as do G. E. Smith and Stafford(31). Some also attribute to it a local secretory function, especially in connection with menstruation. Its growth at puberty and during pregnancy, and its hypertrophy after exposure to *x*-ray show the independence of its function from that of the rest of the generative gland. While the activity of the follicular apparatus during pregnancy and after *x*-ray exposure is inhibited, the interstitial gland shows, under these conditions, histological signs of an increased activity.

As to the Graafian follicles, they have unquestionably the most

[1] The corpus luteum, according to some authors, has a trophic influence upon nutrition of the ovum during the early period of pregnancy only; that is, before the placenta is physiologically capable of performing its function.

[2] According to A. W. Hewett (29), the cortex cells resemble the interstitial cells of the testicle and the luteum cells of the ovary.

important sexual functions. On rupture they discharge the ova; after the rupture they give rise to the corpus luteum. Do they have any function before rupture? Many authors ascribe to them the maintenance of the secondary sex characteristic, and Biedl goes so far as to say that they are possibly responsible for all the chemical relationships which are ascribed to the ovary as a whole. At the present state of our knowledge, it is hardly possible to state definitely whether the interstitial gland or the unruptured Graafian follicles produce the extrasexual internal secretion, the suppression of which brings about during menopause the disturbances in the endocrine and vegetative (nervous system).[1]

ENDOCRINE CORRELATIONSHIPS.

According to Kohler(32) the endocrine glands are continuously producing their hormones; and although these products of internal secretion are not always found in the blood, they are regularly thrown into the circulation by the endocrine glands. The endocrine system is so finely balanced that a change in the internal secretion of one organ is capable of upsetting the entire system, the equilibrium not reëstablishing itself until the proper readjustment is brought about. One, therefore, must consider the interrelationships between a disturbed endocrine gland and the rest of such glands before attempting to explain the symptomatology produced by the cessation or improper performance of function on the part of the individual endocrine gland. When one carefully goes over the literature on the subject of endocrinology, he is struck with the lack of definite data on this subject. The internal secretions of most of the endocrine glands have more than one active principle, unisolated, undifferentiated, and with only partly defined physiological actions. Under such conditions one can easily understand the difficulties we must meet in tracing the symptoms resulting from the disturbed endocrine equilibrium (endocrine correlationships) following the removal from the circulation of the rather incompletely understood ovarian secretion.

OVARIAN AND ADRENAL CORRELATIONSHIP.

Of all the correlationships, that with the adrenal, thyroid, and pituitary are best known. The adrenal body represents the anatomical association of two elements, each of which is derived from a

[1] As neither the interstitial gland nor the Graafian follicle disappears completely and suddenly at menopause, it is possible that the severity of the climacteric disturbances depends on the amount of these tissues remaining in the ovary at that time.

separate and independent system. The adrenal body proper, or cortex, is part of the "cortical" or "interrenal" system. It is derived from the germ epithelium and has important functions in connection with the development of the reproductive organs. The medulla is simply an accumulation of chromaphil cells of the same nature, histologically, chemically, and pharmacodynamically, as the small masses of the same cells found along the sympathetic system at other levels. It is derived from the sympathetic nervous system, and is supposed to facilitate this system's functions in certain physiological emergencies. The cortex controls to a certain extent the development of the genital organs Swale Vincent (33), and is largely responsible for the development of the secondary sex characteristic Bulloch and Scueria(34). Its internal secretion, therefore, must be correlated with that of the ovary. During puberty, a period of greatest development of the genital organs and therefore of greatest activity of the adrenal cortex, the ovarian interstitial gland strikingly increases in structure. A great increase is also noticed both in the cortex and the interstitial gland during pregnancy. Both of them, therefore, are synergistically correlated.

The relation of the adrenal medulla and ovary is not as plainly seen, and many different opinions are found in literature on this point. The medulla has no influence on the development of the genital organs, but the structure of the corpus luteum presents all the morphological characteristics of an aggregate of chromaffin cells, of which the medulla is composed, Mullon(35). During menstruation the activity of the chromaffin tissue is increased, as is evidenced by the iron free pigment found in the linea alba, areolæ of breast and external genitals, Falta(36). As the corpus luteum is antagonistic (as mentioned above) to the action of the Graafian follicles, it is very possible that the adrenal medulla, consisting of the same cells, is also antagonistic to the follicles. This view is in accordance with the conclusion arrived at by Keller and Veraldo(37) that the ovary and adrenal medulla are antagonistically correlated. During menopause, when both Graafian follicles and interstitial cells are gradually and rapidly disappearing, the cortex synergistic with the interstitial cells is correspondingly reduced in function; while the medulla, antagonistic to the Graafian follicles, is increased in its activities. If we add to this also the release of the inhibition that the cortex exerts on the vasomotor action of the adrenal medulla (if Gautrelet(38) is right), through its secretion of cholin, we can clearly understand the great increase in the activity of the medulla with the consequent hyperstimulation of the sympathetic system

at menopause. So much for interrelationship between the ovarian and adrenal internal secretion.

THE INTERRELATIONSHIP BETWEEN OVARY AND THYROID.

The interrelationship between the ovary and thyroid is not more definite. We have no complete knowledge about the entire endocrine activity of this gland, but a great deal of light was thrown lately on its possibly most important hormone, thyroxin, isolated by Kendall. According to Plummer, this hormone is a constituent of cellular life and activity; it is a catalytic agent that controls the energy output. He ascribes to the rest of the endocrine glands the role of preparing the different metabolites for the final reaction with thyroxin. The thyroid then must take part in all body disturbances. The severer the body reactions the more active it must become. Its relation to ovarian activity is antagonistic according to many authors, Southeir, Pashon, Gaulstein(39), Champey and Gley(40). It has been commonly observed that, after removal of the ovaries and during menopause, the function of the thyroid increases. As such increase is noticed also during pregnancy, this antagonistic action of the thyroid must be directed against the Graafian follicle, the reduction in activity of which is observed both in pregnancy and during menopause. Such increase however, takes place also during menstruation, when an increase in function is noticed both in the Graafian follicles and interstitial cells. Crotti(41) mentions thyrotoxic cases in which menopause was established at the early ages of twenty-eight, twenty-nine and thirty.

Many authors consider the action of the thyroid synergistic with the ovary, and there are clinical facts that seem to confirm their opinion. Von Eiselsberg(42), for instance, observed atrophy of the genital organs following thryoidectomy. Curchman(43) reported four cases of myxedema following menopause, and one case following castration. Good results have been repeatedly observed from the administration of thyroid extract, especially in conjunction with ovarian preparations in cases of ovarian hypofunction. This difference in observations may possibly be satisfactorily explained, if we differentiate between the effects produced by the interstitial glands and Graafian follicle on the sexual (menstruation, ovulation, pregnancy, etc.) and the extrasexual functions (internal secretions with its endocrine correlationships), and if we assume that the thyroid secretion is antagonistic to that of the Graafian follicles and synergistic with that of the interstitial cells.

The exceptional atrophy of the genital organs that followed thy-

roidectomy observed by V. Eiselsberg might have resulted from too intensive an atrophy of the interstitial ovarian cells with which the thyroid may be synergistically correlated. The favorable influences of thyroid extract in some cases of "local" ovarian hypofunction (sterility and amenorrhea, etc.) may also be explained by the synergistic endocrine correlationship between the interstitial gland and thyroid; for even Frankel, who insists that the corpus luteum controls the nidation and development of the ovum, admits that this function in the absence of corpus luteum is taken over by the interstitial cells (quoted by Biedl p. 400). According to Biedl, the interstitial ovarian gland exercises a local effect on the female genital apparatus, and especially on menstruation. The extract of thyroid may be useful in cases of ovarian hypofunction during the period of sexual activity. The occasional good results obtained during and immediately after the cessation of sexual activity may be due to the fact that small doses of endocrine extract have a tendency to *moderate* the activity of synergistic organs (Gley, p. 181).

The thyroid hypofunction noticed late after menopause and after castration do not argue against the antagonistic correlationships between the thyroid and Graafian follicles. It has never been claimed that the disturbances resulting from the antagonistic correlationship are permanent. They last only until the endocrine equilibrium is re-established. During the process of endocrine rearrangements, the thyroid hyperactivities gradually retrogress. There is no reason, therefore, why occasionally, under the influences of the many endocrine changes, the thyroid should not retrogress too far and too rapidly, and thus bring about myxedematous condition. In the present state of endocrinology we may possibly feel justified in adopting the view that there is an antagonistic correlationship between the thyroid and Graafian follicles, and possibly a synergistic one between it and the interstitial ovarian gland.[1]

There are unquestionably other ovarian endocrine correlationships, but they are at present unknown. We know, however, sufficient about the correlationship between the ovary and pituitary body to justify its consideration.

THE CORRELATIONSHIPS OF THE OVARIAN AND THE PITUITARY INTERNAL SECRETIONS.

There is little uniformity in the views met in literature regarding the pituitary. It consists of two lobes, the anterior-glandular

[1] Gley & Champey(40) found that in the rabbit thyroidectomy was followed by hypertrophy of the ovarian interstitial gland.

and the posterior-nervous. The two lobes of the pituitary with the pars intermedia have different endocrine actions. The anterior lobe, which, until lately, was believed to have no endocrine function at all, is unquestionably a true ductless gland. It is known to influence ovarian function, to preside, to a certain extent, over the skeletal growth, to have a depressor action on the circulation(45), and a stimulating action on respiration(46). The posterior lobe and pars intermedia have a pressor action on smooth muscles, such as the vascular walls, uterus, gastro-intestinal tract, and bladder; it stimulates metabolism and has a galactogogue action.

We are interested chiefly in the vascular and genital actions of the pituitary gland, and especially in its relationships to the endocrine glands disturbed during menopause.

The anterior lobe has a definite endocrine correlationship with the ovary. During pregnancy, the period of follicular inactivity and hyperactivity of the interstitial gland, the anterior lobe becomes more active (Erdheim and Stumme)(44). Its chromophobe cells (chief cells) develop and become more chromophil (pregnancy cells). This change, which denotes increased activity, may manifest itself clinically in such functional alterations as fleeting bitemporal hemianopsy, hypertrophy of the turbinates, and temporary enlargement of the lips and nose, with thickening of the tissues of hands and feet (transient acromegalic changes)(47) (Cushing H). An enlargement of the anterior lobe, (hyperplasia of eosinophil cells) has been also observed after cophorectomy (Bell)(50). On the other hand, among the early symptoms of acromegaly, usually due to hyperactivity of the anterior lobe (its chief cell), are the cessation of menstruation, and sterility (Biedl)(51).[1] This is due to the atrophy and cessation of formation of Graafian follicles resulting in atrophy of the sexual organs.[2] The atrophic changes do not involve the interstitial glands of the ovaries; in fact, acromegaly favors an increase in its structure, as the anterior lobe is synergistic with the interstitial gland, and explains the fact that the secondary sex characteristics, which, as mentioned above, are influenced by the interstitial ovarian gland, are accentuated in acromegaly.

It is possible that it is this correlation that leads Goetch and Schumann(53) to assert that the ovaries are activated by the ante-

[1] Tandler and Grosz(52) go so far as to assert that acromagely is the result of insufficiency in the secretory functions of the gonads.

[2] The changes in the Graafian follicles are, however, seemingly not prominent; for not infrequently during periods of abatement in the processes of acromegaly the sexual functions become re-established.

rior lobe of the hypophysis. The correlationship of the anterior lobe of the pituitary with the interstitial ovarian gland is seemingly synergistic, and with Graafian follicles antagonistic. This last correlationship may explain the view of Isaac Ott(48) that the interrelationship between the ovary and pituitary is antagonistic. The anterior lobe of the hypophysis is also definitely related to the thyroid, and in this relation it is seemingly anatagonistic. In parenchymatous goiters (a low thyroid activity), in cases of myxedema and cretinism (Biedl)(72),[1] and in thyroidectomised cases (Biedl)(73) p. 338) (Hewett)(29), an increased activity of the anterior lobe has been reported by different authors. On the other hand, it has been observed that the thyroid enlarges after the removal of adenomas in acromegaly, and that in exophthalmic goiters the anterior pituitary lobe hypofunctionates (Benda).

The correlationship between the anterior lobe of the pituitary and the adrenal has not as yet been sufficiently investigated. Cushing (74) maintains that in hyperpituitarism the suprarenals become inactive, and in hypopituitarism the suprarenal activities increase; in other words, that their relationship is antagonistic. According to Biedl(75) after extirpation of the suprarenals, signs of hyperplasia of the hypophysis in the dog were noticed, and adenoma and cystic degeneration of the adrenals were found in acromegaly.

The posterior lobe of the hypophysis, while it is used extensively in gynecology and obstetrics, has not, as far as it is known, any action on the ovarian function. Its complete removal induces no changes in the genitalia, and does not interfere with their development in young females (Bell)(54). Neither has the sexual gland any influence on the posterior lobe. The common use of the latter in pelvic condition is due to its stimulating action on the uterine muscle. By such action it can contract the gravid and non-gravid uterus, as it does the musculature of paretic bladder, stomach, and intestines.[2] In postpartum hemorrhages, in hemorrhages due to increased activity of thyroid and ovaries the benefit derived from administration of the extract of the posterior lobe is due to its actions on the uterus and not on the ovaries.

So far as the vascular action of the posterior lobe is concerned,

[1] Pineless emphasizes the frequency between myxoedema (thyroid insufficiency) and acromegaly (hyperfunction of the anterior lobe).

[2] There is a difference of opinion as to what lobe of pituitary is responsible for dystrophia adipiso genitalia. It has been believed that it was the anterior. But according to the latest view of Cushing and Fishera(55), it is due to the insufficiency of the posterior lobe. Bell(96), however, ascribes it to interference with the secretory function or blood supply of the entire gland.

as far as our knowledge goes it has no correlationships with the ovarian internal secretions. This action is of a vasoconstrictor nature, and resembles that of adrenalin, although it is not in one of the groups to which adrenalin belongs (Dale)(56)[1]. It differs, however, from adrenalin in its direct action on muscular wall (X), in its primary depressor and longer pressor effect on the general circulation, in its constriction of coronary and pulmonary arteries (Dale, Bonis and Sussana)(60) and dilation of renal vessels in production of diuresis (Magnus and Schaffer)(61), and in primary inhibition and subsequent augmentation of peristalsis (excitation of plexus of Auerbach) (Bayer)(62).

We have shown, as far as we could find and interpret the experiments and opinions of the authors contained in accessible literature, the factors that may have a bearing on the climacteric manifestations. How are they brought about, or, more correctly, how may they be explained?

In menopause we find a reduction or a cessation of the endocrine activities of the interstitial and follicular tissues of the ovaries. Under the influence of this reduction or cessation of the ovarian function, the activity of the adrenal cortex, which is synergistic with the interstitial tissue, is reduced and the activity of the adrenal medulla which is antagonistic to the follicular tissue, is increased. As a result of this change an hyperfunction of the adrenal medulla and of the sympathetic nervous system is brought about.

The thyroid may and may not be directly influenced by the partial or complete suppression of the interstitial and follicular functions of the ovary. These two tissues, if the degree of their suppression be the same, may completely neutralize each others influence on the thyroid. But the hyperfunctionating adrenal medulla, synergistic with the thyroid, increases the latter's activity, either indirectly through the sympathetic, or through both the sympathetic and the endocrine correlationships.

[1] It is produced by the pars intermedia (Miller, Lewis and Hamburger) (57), and acts as a pressor on smooth muscles;—uterus, stomach, intestines, and bladder, and muscle fibers of spleen and vascular wall. By the combined action of peripheral vasomotor constriction and increased force of heart action it raises the blood pressure (Cushing) (58). According to some, in the posterior lobe are found also depressor substances which account for a slight fall preceding the rise that infundibulin causes. In fact, in large doses the depressor effect may be so marked as to mask the usual subsequent rise (Silverstrini) (59). The renal vessels appear to be exempt from the peripheral vascular constriction; they dilate and, after a latent period of contriction, maked diuresis occurs, due to a specific stimulation of the real equilibrium.

The pituitary also is seemingly influenced by the ovarian changes. Its posterior lobe has no endocrine relationship at all to the ovary and its anterior lobe, as a result of the opposite actions upon it of the two ovarian structure, also remains unchanged. The anterior lobe, however, is synergistic with the adrenal (medulla?) and antagonistic with the thyroid.

We have, then, adrenal glands (medulla) discharging into the circulation at a time of constitutional distress, (menopause), and adrenalin which activates the entire sympathetic system through its nerve endings at their myoneural junction, the degree and possibly the time of the stimulation depending on the quantity and time of the delivery of the adrenalin into the circulation. The sympathetic system is in a state of an intermittent and irregular stimulation.[1] Additional stimuli therefore, are being sent to all organs supplied by the sympathetic system: activating stimuli to the heart, vascular system, (vasoconstrictor), sweat glands, and thryoid, inhibitory stimuli to the smooth muscles and glands of viscera and to some blood vessels (vasodilators). The state of hyperfunction of the thyroid is thus induced entirely by this hyperstimulation of the sympathetic system, for the vagus has no influence on its secretion at all (Cannon)(19). This thyroid hyperactivity is of greatest importance in connection with the menopause disturbances.[2] The thyroxin, as we mentioned above, controls the energy output.

When hyperfunctionating, the thyroid stimulates the activity of all the body cells. Such an increase of activity means an increase of heat production. This is in accordance with Cramer's recent conclusion that the thyroid and adrenal form part of the mechanism for the chemical heat regulation of the body (63); but on the other hand the hyperactive medulla, by its stimulation of the sympathetic system, increases the constriction of the visceral and cutaneous vessels and the dilatation of the vessels of the skeletal muscles. This cutaneous vascular constriction naturally interferes with the heat variation. The body heat (heat in the blood) is increased. This increase in heat gives rise to impulses which, carried by the afferent vasodilators of the sympathetic or possibly also

[1] Adrenalin is not retained in the circulation long, as it is destroyed rapidly in the blood, if not combined with the structures it is to act upon.

[2] The sympathetic nervous system supplies the branches of the superior cervical ganglia, which, when hyperstimulated, cause thyroid hypersecretion (through thyroideal nerves), tachycardia (through the cardiac branches), exophthalmos and widening of palpebral fissure (through the muscular branches of the Müller and Landstrom muscles).

of the parasympathetic, cause a reflex cutaneous vascular dilation,[1] which, together with the accompanying hyperactivity of the sweat glands, increases the heat radiation and re-establishes the normal heat of the blood. The hot flashes of menopause, therefore, are a sudden reflex cutaneous vascular dilatation that takes place whenever there develops an increase in the body heat. This increase in body heat is possibly brought about by an excessive heat production through hypersecretion of thyroxin and diminished radiation through hypersecretion of adrenalin.[2]

We shall now take up the description of the hot flashes, basing it on the data obtained from our records.

STATISTICAL DATA ON HOT FLASHES.

The writer's observations on hot flashes were made from records of 563 cases that gave menopause information. Of them 483 had hot flashes and 80 had none. Fifteen per cent. of the patients then, had no hot flashes.

In 78 per cent. of the patients, the flashes appeared before the cessation of menstruation; in 15 per cent. about the time of cessation, and in 7 per cent. after.[3] In the patients that had premenopause menorrhagia, the hot flashes seemed to have begun somewhat earlier than those that had not. Thus 73 per cent. of the former developed the flashes before menopause, 20 per cent. at about the time of cessation of menses, and 7 per cent. after; while in the latter 66 per cent. developed them before, and 21 per cent. at the cessation of menses and 13 per cent. after.[4]

[1] According to F. Kraus, (64) "the thyroid secretion acts on the tone of the vagus, and, therefore, is a vagotropic or, better, parasympatheticotropic."

[2] J. Potter(21) claims that the hot flashes are vascular dilation to overcome the high pressure common during menopause. According to Bell(79), to hot flashes are due to sudden variation in the blood pressure and are probably the result of irregular action of the thyroid.

[3] The total number of patients that gave us information on this point was 303.

Began flushing before menopause	237—78 per cent.
Began flushing before time of menopause	44—15 per cent.
Began flushing after menopause	22— 7 per cent.

[4] Total number of cases whose records showed no menopause menorrhagia, 150. Of these, the hot flashes began

Within 6 months before menopause	6
Within 1 year before menopause	17
Within 2 years before menopause	40
Within 5 years before menopause	28
Five years and more	11
At about last period	30

SEVERITY OF HOT FLASHES.

The severity of the hot flashes showed great variations. One has to bear in mind that there is normally in people a variation in the distention of the cutaneous (especially the facial) vessel. The cutaneous vascularity is influenced by constitutional peculiarities, occupation, heredity, climate, etc. Pigmentation also influences vascularity, for the higher the pigmentation, the less vascular, as a rule, are the face and the skin in general. This relation between pigmentation and cutaneous vascularity is noticeable in individuals as well as in whole nations. The Teutonic face, for example, is redder than that of the Italian.

A great variation in the severity of hot flashes, independent of the above, has been noticed in the climateric women. Thus women that gave a history of premenopause menorrhagia showed a slightly higher percentage of severe hot flashes than the ones that had none.[1] Fibroid cases showed a smaller per cent. of severe hot flashes than either of the above classes. We noticed also some relation in the severity of hot flashes to the interval between the last pregnancy and the cessation of menses. The longer the interval, the smaller was the percentage of the hot flashes.[2] The severity of hot flashes was found to be influenced by the patient's general nervous condition.

Within two months after cessation of menstruation..... 5
Within six months after cessation of menstruation..... 3
Within two years after cessation of menstruation..... 6
Within four years after cessation of menstruation..... 3
Four years and more after cessation of menstruation..... 1

Of the 55 cases that had premenopause menorrhagia, the hot flashes appeared

Within 6 months before menopause..... in 1 case
Within 12 months before menopause..... in 4 cases
Within 2 years before menopause..... in 15 cases
Within 5 years before menopause..... in 9 cases
Five years or more before menopause..... in 11 cases
The last period..... in 11 cases
1–2 months after cessation of menstruation..... in 2 cases
2 years after cessation of menstruation..... in 2 cases

[1] Of the 120 cases that had no premenopause menorrhagia, 54 had severe hot flashes, 66 moderate. Of the 57 that had premenopause menorrhagia, 27 had severe and 30 moderate hot flashes.

[2] The number of those whose interval between last pregnancy and menopause recorded was 188.

The number of patients with an interval below 10 years was 61. Of these 19 had severe and 42 moderate flashes. Above 10 years was 97. Of them 19 had severe flashes and 78 moderate.

There were only 15 cases that gave an interval of 5 years or less, and of them 5 showed sevère symptoms, while 10 suffered moderately.

A percentage of severe hot flashes higher than the average was noticed among patients presenting severe nervous symptoms.[1] The age at menopause seems to have some bearing on the severity of hot flashes. Patients who reached menopause below the age of 40 had a higher percentage of severe flashes than those who had the climacterium after forty.[2] The weight of patients did not seem to influence the severity of flashes. As the hot flashes are looked upon as desirable "safety valves" for high blood pressure during the climacterium (Potter)(21), it may be of interest to know that of 67 cases having a blood pressure above 150, 33 had severe flashes and 34 moderate (49.2 per cent. 50.8 per cent.); while of 58 that had a blood pressure below 150, 37 had severe and 31 moderate (46.5 per cent. and 53.5 per cent.), a slightly greater percentage of severe hot flashes in cases with blood pressure above 150.

DURATION OF THE FLASH.

The duration of the hot flashes were given as between one minute to 2 to 3 hours. The psychic and general condition of the patient were given as factors influencing the duration. In 66 per cent. of the records the flash lasted from one minute to five minutes (the minimum) and only about 1 per cent. from one to three hours (the maximum).[3]

NUMBER OF YEARS THAT THE HOT FLASHES LASTED.

An interesting point about the hot flashes is the number of years that they lasted. Only three of the records showed a duration of less than six months. Of the eighty-nine cases, only 11 reported the cessation of the flashes within two years after their first appearance.

[1] There were records of 163 "nervous" cases with a definite description of the hot flashes, 48 of which were bad "nervous" cases, and 115 moderately so. Of the first, 15 had severe hot flashes, 33 moderate (34 per cent. and 66 per cent.). Of the later only 27 had severe and 88 moderate (23½ per cent. and 76½ per cent.)

[2] Of 83 patients who stopped menstruating after forty years two had severe and 81 moderate flashes (24 per cent. 97 per cent.) while of 28 that stopped menstruating before forty years, 10 had severe and moderate 18 flashes (36 per cent. and 64 per cent.).

[3] 105 records gave the duration of the flashes as follows:

1 to 5 minutes	68 cases	15 to 30 minutes	9 cases
5 to 10 minutes	9 cases	½ hour to 1 hour	5 cases
10 to 15 minutes	9 cases	1 hour to 3 hours	5 cases

The maximum time in our records is from ten to fifteen years, and five of them reported the flashes still continuing.[1]

FREQUENCY OF HOT FLASHES AND THEIR OCCURRENCE DURING THE NIGHT.

The frequency of the flash was given as varying from one every fifteen minutes to several in a year. Physical exertion, pyschic influences, and the return of uterine bleeding after cessation of menses seemed to have increased the frequency of the flashes.[2] Most of the patients reported that the flashes occurred during the day, metabolism not being as active during the night. Of the eighty-six cases that specified the occurrence or absence of hot flashes during the night thirty-three (cases) had no nocturnal flashes. Of the ones that had, some were awakened from sleep while the flashes were still on, and others after they had been over, patients finding themselves bathed in the "after flash" perspiration.

THE ORIGIN AND DIRECTION OF THE HOT FLASHES.

One hundred and fifty-eight cases of specified origin and directions of the hot flashes. In thirty-five the flashes were limited to the face or face and neck. In forty-nine they were limited to the upper half of the body, the flash radiating upwards; of these in forty-one it was confined to the anterior surface, in eight to the posterior surface of the body. In forty-six cases the flash extended all over the body; of these in twenty it radiated from the head

[1] Of the total number of records on this point 27 reported that flashes had stopped for

2 years or less	11
2 to 3 years	2
3 to 4 years	5
4 to 5 years	2
5 to 10 years	2
10 to 15 years	2

Sixty-two reported as still flashing as follows:

2 years or less	11
2 to 3 years	8
3 to 4 years	13
4 to 5 years	10
5 to 10 years	15
10 to 15 years	5

[2] 120 patients specified the frequency of their flashes as follows:

Few in a year	1 case	1 to 5 times daily	66 cases
Once every 2–4 weeks	8 cases	5 to 10 times daily	8 cases
One to 5 during week	13 cases	10 or more times daily	24 cases

downward; and in twenty-six it appeared all over the body, the patient being unable to specifiy its origin. In seventeen the flash radiated from below upward; sixteen of them gave the direction from feet upward, and one from the thigh up. In one the flash originated in the middle of the abdomen and radiated from there up to the face and down to the feet.

A few interesting distributions of hot flashes may be mentioned here:

Hot flash begins in left lower quadrant and radiates up left side of body. The whole face flashes, but the left side is hotter. Perspiration follows flash.

Sensation of hot steam going through the right leg.

Hot flash goes up the hands and occasionally also in the face; perspiration follows flash.

Flash occurs in hands, feet, and tongue.

Only the ears become red; no perspiration.

Sensation of blood rushing up the whole right side of body to face.

Occurs only on arm and neck.

Only part of the face affected—usually starts on right cheek and then goes over to left cheek. Nose always white during flash; occasionally forehead alone flashed and occasionally entire face. An "inside burning up" sensation. Lasts about 10 minutes, often on awakening in the morning. Skin not hot, nor red, nor perspiring. No other flashes.

The flash begins in the palms of hands and travels along inner aspect of arm to elbow joint. No flash anywhere else.

Hot flash from abdomen up to face and down to feet. Leaves red blotch for about an hour on face. Lips tremble during the flash.

HOT FLASHES AND CHILLS.

One hundred and sixty cases specified the presence or absence of chill or chilliness in connection with the flashes. Of them, twenty-seven (17 per cent.) had no chills, eighty-six had chilly sensations, thirty-five definite chills after the flash, twelve during the flash, and one patient emphatically stated that the chills occurred during the flashes.

HOT FLASHES AND PERSPIRATION.

Of the 108 cases that specified the relation of perspiration to the hot flashes, seventy (65 per cent.) perspired with flashes, thirty-eight (35 per cent.) did not. Perspiration was most commonly seen with the flashes radiating from head downward (seventeen out of eighteen cases); next in frequency in flashes from abdomen upwards (eighteen out of twenty-two); then in flashes from feet up (seven out of eleven); from chest up (four out of seven); then in flashes limited to face and

area (fifteen out of thirty-one); and the least in flashes limited to back (two out of six.)

HOT FLASHES—VERTIGO AND TINNITUS.

Of 117 cases that definitely reported on the relation of hot flashes and vertigo, only twenty-four cases stated that the vertigo occurred only during the flashes, and four that vertigo preceded the appearance of the flashes. Tinnitus was not commonly reported with the hot flashes. The definite relation of tinnitus to flashes was given only in nine cases, and of them four asserted that it occurred during the flash.

TREATMENT.

From the facts gathered above one may see the difficulty in outlining a treatment for menopause in general, and for the hot flashes in particular. The severity of the menopause disturbances depends, first of all, on the rapidity with which the ovarian tissues producing the hormone (interstitial cells, Graafian follicles, or possibly the parovarium) (Bucara)(65) atrophy. The more rapidly it disappears, the more acute should be the disturbances of the endocrine system. On the other hand, the more rapidly the endocrine equilibrium is established, the less severe and the less lasting such disturbances should be: This condition explains the different degrees of severity of the menopause symptoms as generally observed and as seen from our statistical data. On this degree of their severity must depend, of course, the need and the intensity of treatment. In severe cases the temporary nervous and metabolic disturbances demand such regulation of habits and such treatment as to conserve the nervous energy and promote the proper nutrition and elimination.

As the climacteric symptoms are caused by the endocrine disturbances resulting from partial or complete cessation of ovarian internal secretion, relief from them has been sought in organotherapy. It must be remembered that an organic preparation may be used to (1) replace a deficient secretion; (2) to increase an insufficient secretion; (3) to antagonize an excessive secretion; or (4) to produce the physiological effect of the organtherapeutic agent. So far no striking results have been reached. The reasons for the comparative failure are not difficult to trace. The organtherapeutic preparations, with the exception of adrenalin and, lately, thyroxin, are extracts of the organs. Quoting Gley(66), "It is necessary to ask oneself whether all the glands normally produce substances identical with those whose action are manifested by the extracts.

In fact, the substances contained in the extracts may not exist in the living glandular tissue; furthermore, nothing proves *a priori* that, if they are formed in the living gland, they regularly leave it by the blood vessels in order to exercise their influence on the different arterial regions of the organism." These views are shared by others (Lewandowsky, Biedl)(67). Again, there can hardly be any regularity in the action of organic extracts. They may vary according to conditions of animals from which they were taken (age, sexual activity, fatigue, etc.) (Gley)(68); according to the mode of preparation, the time that elapsed between the extirpation of the organ and the preparation of the extract, the degree of autolysis that could have taken place in the interval, the manner in which the organ was preserved, the method of its use, etc.

In addition to this, most of the endocrine glands have more than one active hormone. The extract of an organ, therefore, is a conglomeration of their substances which must give rise to a complex action. Endocrine glands do not act in this way. They deliver to the circulation their individual products in accordance with the body's physiological requirements. Again, these organic extracts have a toxicity common to all organic extracts, which may mask the action of the specific endocrine substances.[1] The isolation of the active chemical agents of internal secretions will enable us to learn their physiological action and their dosage, their indication and contraindications. Organotherapy will be then placed on a sound basis. With the aid of its definite chemical agents, we shall be able to define more correctly the complicated correlationships of the endocrine glands, to unravel the complex syndromes of the different endocrine disturbances, and to establish more scientific organotherapeutic principles.

At the present stage of our knowledge one cannot expect too much from organotherapy; we cannot expect a successful organotherapy in menopause. Not only have the active principles of the ovarian internal secretion not been isolated, but it is not even definitely settled which part of the ovary secretes the hormone.

[1] In this connection attention may be called to the so-called tachyphylaxis or very rapid immunization against the toxic action of organic extracts (Cesa-Bianchi, Dold, Ancel, Bouin, Lambert, Champey, Gley) (69). This phenomenon of tachyphylaxis for a given extract may be provoked by another extract. Gley (70) quotes the opinion of a number of investigators that the action of an endocrine extract is reduced on repeating its injection: the second injection, for instance, of pituitary or corpus luteum will show a less marked action than the first injection. Such tachyphylactic action is not seen after the injection of the isolated active principles (adrenalin).

We find in literature many different and contradictory reports on the value of ovarian preparations in climacteric disturbances. Some would claim that the ovarian gland substances (whole ovary) are inert, and that the extract corpus luteum is the drug to be used in menopause, while others will claim exactly the opposite. Some get excellent results from corpus luteum when it is used hypodermically only; others get good results when administered per orem. Some consider organotherapy in menopause of no use at all; others see in it almost a specific. If organotherapy is to be used in menopause, the ovarian preparation must first be considered. But what part of the ovary is best suited to meet the endocrine disturbances? The cessation of formation of corpus luteum, as we saw above, can hardly be responsible for these disturbances. The reduction or cessation of internal secretion of the interstitial and follicular structure—either one or the other, or both—is in all probability responsible for them. It is this change in ovarian function, causing the hyperactivity of the adrenal medulla and the thyroid, that brings about the annoying climacteric symptoms. The proper organotherapeutic measure would be, therefore, the one that could, on one hand, subdue the activities of these two endocrine structures; and, on the other hand, substitute for the missing ovarian internal secretion until the endocrine equilibrium be established. We have seen above that in the present state of endocrinology we may justly suppose that the Graafian follicles are antagonistic to the adrenal medulla, thyroid, and anterior lobe of the pituitary; that the interstitial ovarian cells are synergistic with the adrenal cortex, thyroid, and anterior lobe of pituitary; that the corpus luteum is antagonistic to the Graafian follicles; that the posterior lobe of the pituitary has no correlationship with the ovarian secretion; and that the thyroid is synergistic with the adrenal medulla and anterior lobe of pituitary. There are also in all probability correlationships of the ovary with other endocrine glands; but as far as we can see, there are definitely none which have been traced. If the foregoing correlationships are correct, one may venture an organotherapeutic outline for menopause which may be as efficient as it is possible to make it by the use of organic extracts instead of the desirable active principles.

We have then hyperactive adrenal medulla, sympathetic system, and thyroid and posterior hypophysis. The organotherapy of menopause, therefore, should include as far as our knowledge goes at present the follicular structure of the ovary, which would reduce the activity of the adrenal medulla and thyroid. We may add the

extract of the adrenal cortex and the extract of the anterior pituitary lobe to overcome the reduction, or neutralization of the depressor action of these tissues by the posterior lobe of pituitary and adrenal medulla. The corpus luteum, which acts as inhibitor of follicular activity as seen during pregnancy, is theoretically at least contraindicated. It seems, therefore, that organotherapy for menopause disturbances should be a combination of the substances of follicular ovarian tissue, adrenal cortex, and anterior pituitary. It may be difficult and may be impossible to obtain a pure follicular extract, but according to W. Blair Bell(71) "an extract made from the hilium is believed to contain the active principles of the interstitial cells alone." The removal of the corpora lutea and the hilium of the ovary may enable us to obtain a comparatively free ovarium follicular substance.

We have no personal experience with the organotherapeutic suggestions just outlined. It is based only on our analysis of the literature accessible to us. We have been using the "whole ovary" extract (Varium B. W. Co.,) (gr. V. t.i.d.) and the extract of corpus luteum (Luteum gr. ii, t.i.d. H. W. & D. Co.), occasionally adding small doses (gr. $\frac{1}{10}$) of thyroid extract.

We collected some statistical data on the treatment with these preparations, but we omitted them from this paper as they are to be used later as a separate communication. We wish, however, to say that our data show (1) that the full ovarian substance is a better preparation than the corpus luteum for the relief of menopause symptoms, especially for the hot flashes and vertigo; (2) that the addition of small doses of thyroid (gr. $\frac{1}{10}$) occasionally seem to give somewhat better results;(3) and that the results of organotherapy as at present practiced cannot be called strikingly good. In general, we can only repeat what we said a year ago.(78) "The results obtained from the ovarian substances, while sometimes strikingly good, are frequently so ineffective as to raise the question whether it has within it the same finished products that the internal secretion consists of: and if it has, whether it is competent to take care of the functional changes of the correlated endocrine glands brought about by the functional changes of the ovarian secretion. For it is quite generally accepted that, on account of the interrelation of the endocrine glands, dysovarism induces changes in the functions of such glands as thyroid, adrenal, and pituitary. The apparent recent tendency of pluriglandular therapy is an admission that the ovarian substances alone cannot always meet the disturbances of the dysovarism. It remains to be seen whether pluriglandular therapy can meet them better."

REFERENCES.

1. Goltz & Ewald. *Archives für ges. Physiol.*, lxiii, p. 362–400.

2. Rudski S. & J. Hornowski. *Erythromelalgic Neurolgia polska*, 1912, vol. ii, 1896.

3. Keith. Quoted by McLoriman Margaret. "Studies on Cases of Uterine Abnormality," *Medical Journal of Australia*, July 5, 1919.

4. Francois-Franck & Hallion. Recherches sur l'nnervation vasomotrice du corps thyroid J. D. P. P., pp. 442–454, 15 mai, 1908.

5. Bradford R. J. "The Results Following Partial Nephrectomy and the Influence of the Kidney on Metabolism, JOP, 23, p. 414, 1899.

6. Gaskell. "The Involuntary Nervous System, London, 1916, Longmans, Green & Co., p. 36.

7. Ludwig & Cyon. Ber. d. sachs. Ger. d. Wiss., 1866 quoted by Luciani, 1911, vol. i, pp. 333.

8. Weber. Quoted by Higier. "Vegetative Neurology" Nervous and Mental Disease Monograph Series No. 27, 1919, p. 110.

9. Stricker. Quoted by Higier. *ibid.*, p. 111.

10. Dastre & Morat. "Recherches sur le systeme Nerveux Vasomoteur," Paris, 1884, quoted by Luciani, *ibid.*, pp. 354.

11. Dittmar. Quoted by Luciani, *ibid.*, vol. i, p. 363.

12. Luciani. Human Physiology, vol. i, Eng. *Trans.* by F. A. Welby, 1911. MacMillan & Co., p. 366–367.

13. Tschermak. Quoted by Higier, *ibid.*, p. 110.

14. Heidenhain. Quoted by Luciani, *ibid.*, p. 361.

15. Luciani. Luciani Human Physiology, 1911, vol. i.

16. Schwartz, C. u. F. Lemberger. "Uber die Wirkung Kleinster Saueremengen auf die Blutgefasse "Pfluger's Arch,. 1911, B. A., 141.

17. Kretschmer & Kleissel. Quoted by Higier, *ibid.*, p. 113.

18. Bailey & Miller. "Text Book of Embryology" Wm. Wood & Co., 3d Edition, p. 427.

19. Cannon, W. B. & Lymon, H. "Depressor Effect of Adrenalin on Arterial Pressure," Amer. Jour. of Physiology, vol. xxxi, p. 376, 1913.

20. Hartman, F. A. "Adrenalin Vasodilator Mechanism, "*Endocrinology*, 1918, vol. i, No. 2.

21. Hoskins, R. G. "The Relation of the Adrenal Glands to the Circulation of the Blood" *Endocrinology*, vol. i, No. 3.

22. Lohman. Quoted by Falta Wilhelm: Ductless Glandular Diseases *Trans.*, M. K. Meyers, p. 345.

23. Gautrelet. La Choline Son Role Hypotenseur dans l' organisme, de Phys. et Path. xi, p. 227, 1909.

24. Gley, E. "The Internal Secretions," *Trans.* by M. Fishberg, Paul B. Hoeber, N. Y., 1917, p. 161.

25. Biedl, Arthur. "Internal Secretory Organs," *Trans.* by Linda Forster, Wm. Wood & Co., N. Y., 1913, p. 325.

26. Fraenkel, L. "Zur Funktion des Corpus Luteum, 68, 1902.

27. Leopold & Ravans. "Neuer Beitrag zur Lehre von der Menstruation und Ovulation, 83, 1907.

28. Mulon & Wallart. Quoted by Biedl, *ibid.*, p. 401.

29. Hewett, A. W. Functional Pathology of Internal Dis., 1917.

30. Limon. Quoted by Biedl, *ibid.*, p. 399.

31. Smith & Stafford. "New System of Gynecology," Eden & Lockyer, vol. i, p. 61.

32. Kohler. "Endocrine Therapy in Amenorrhea," Zentralbl f. Gyn. (Leipsig) 1911, xxix, 667.

33. Vincent, Swale. "Recent Views as to the Functions of the Adrenal Bodies," Endocrinology, vol. i, No. 2, 1917.

34. Bulloch & Sequeira. "The Relation of the Suprarenal Capsule to Sexual Organs," *Trans. Path. Soc. London*, 1905, lvi, p. 189.

35. Mulon, P. "Les glandes hypertensives ou organes chromaffines A. gen. de med.," No. 52, 1904.

36. Falta, Wilhelm. "Ductless Glandular Diseases," *Trans.* M. K. Meyers, p. 379.

37. Keller & Veraldo. Quoted by Harrower "Practical Hormone Therapy." P. B. Hoeber, N. Y., 1914.

38. Gautrelet. Quoted by Biedl, *Ibid.* p. 278. La Choline sur rolehypotonseur daus l'organisme J. de physiol. et Path. gen. March 2, 1909.

39. Southier, Pashon & Gaulstein. Quoted by H. Climenko, "Corpus Luteum in Neurological Practice "Endocrinology vol. iii, No. 1.

40. Champey & Gley. Quoted by E. Gley. "The Internal Secretions," p. 211.

41. Crotti, André. "Thyroid and Thymus," 1913.

42. Von Eiselsberg. "Uber vegetative Storungen im Wachstume von Thieren nach fruhzeitiger Schilddrusen exstirpation," Arch. fur klin, Chirurgie, 1895, xlix, p. 207–234.

43. Curschmann, H. *Zeitscher für d. gesam Neural. u. Psych.* (Berlin), 1918, xli, 155.

44. Erdheim & Stumme über die Schwangerschaftsveranderung der Hypophyse. Beiter. z. Path. Anat. u. Physiol., xlvi, 1909.

45. Iokovic, Falta & Hamburger. Quoted by Falta, *ibid.*, p. 273.

46. Falta, *ibid.*, p. 273.

47. Cushing, H. "The Pituitary Body and Its Disorders," 1912, p. 234.

48. Ott, Scott, Schaffer & McKenzie. Quoted by Falta, *ibid.*, p. 272.

49. Isaac, Ott. "Internal Secretions from a Physiological and Therapeutic Standpoint," Phil., 1910, p. 125.

50. Bell, W. Blair. "The Pituitary" Wm. Wood & Co., 1919, p. 193.

51. Biedl, *ibid.*, p. 339.

52. Traundler & Grosz. Quoted by Biedl, *ibid.*, p. 339.

53. Goetch & Schuman. E. Goetch, Comment on Dr. Robertson's article on Tethelin, Endocrinology, vol. i, No. 1, 1917. E. A. Schumann, Dystrophy Adiposo Genitalia in Women, Amer. Jour. Obst., 1918.

54. Bell. The Pituitary, *ibid.*, p. 167.

55. Cushing & Fishera. Quoted by Bell, *ibid.*, p. 244.

56. Dale, H. A. The Action of Extract of Pituitary body, Biochemical Jour., 1909, iv, 427–447.

57. Miller, Lewis & Hamburger. Quoted by Bell, *ibid.*, p. 97.

58. Cushing. "The Pituitary Body and its Disorders, quoting Oliver & Schaffer, p. 8.

59. Silverstrini. Quoted by Cushing, *ibid.*, p. 8.

60. Dale Bonis & Susanna. Quoted by Bell, *ibid.*, p. 108.

61. Magnus & Schaffer. Quoted by Bell, *ibid.*, p. 109.

62. Bayer & Peter. Quoted by Cushing, *ibid.*, p. 9.

63. Cramer, W. The Thyroid-adrenal Apparatus and its Function in the Heat Regulation of the Body. Jour. Physiol. (London) 1916, i, xxxviii.

64. F. Kraus. Quoted by Gley, *ibid.*, p. 187.

65. Bucura. Quoted by Biedl, *ibid.*, pp. 407–408.

66. Gley E., *ibid.*, p. 108.

67. Lewandowsky, Biedl. Quoted by Gley, *ibid.*, p. 108–108.

68. Gley, E., *ibid.*, p. 115.

69. Cesa Bianchi, Dold, Ancel, Bown, Lambert, Champey & Gley, Quoted by Gley, *ibid.*, p. 119.

70. Gley, E., *ibid.*, p. 122–124.

71. W. Blair Bell. "The Sex Complex."

72. Biedl. Quoting Pineless, *ibid.*, p. 338.

73. Biedl. Quoting Rogowitch, *ibid.*, p. 338.

74. Cushing. Quoted by Bell, "The Pituitary," Wm. Wood & Co., N. Y., 1919, p. 213.

75. Biedl. *ibid.*, p. 339.

76. W. Blair Bell. *ibid.*, p. 246.

77. W. Blair Bell. *ibid.*, p. 309.

78. K. I. Sanes. Vertigo of the Menopause. Amer. Jour. of Obstet. and Diseases of Women and Children, vol. lxxix, No. 1, 1919.

DISCUSSION ON THE PAPER OF DR. SANES.

Dr. James E. Davis, Detroit, Michigan.—This paper deals with a very fascinating subject. It is very difficult for one to define clearly and, at the same time, adhere very closely to well worked out scientific facts. The difficulties that may arise are these: In experimental work one would need to have controls that are very difficult to obtain. For example, in determining the interrelations of the endocrine system, in determining the basic metabolism, in determining the condition of the sympathetic nervous system, to establish standards for the material to work with is very difficult. Each case, it seems to me, ought to be studied with these points in mind, and then we ought to determine in our therapeutic measures, if we have to use therapeutic means, to get some of the data required for conclusions, and to do this we would have to put the patients through the therapeutic tests, to test out the sympathetic nervous system. I imagine the cases ought to be taken out of the old environment and placed in a new and different environment before testing. Basic metabolism tests ought to be applied in these cases; then the therapeutic use of the different organic extracts might be properly controlled. All of this involves a very difficult procedure, but one that must in time yield very fertile results.

I am sure, the author is to be complimented for delving into a subject of this kind, which will in time bring very valuable results.

THE CYSTIC OVARY.

BY

FRANCIS REDER, M. D.,

St. Louis, Mo.

A MODERATE acquaintance with the cystic ovary, gleaned through serious and earnest attention whenever the condition was encountered during an abdominal section, has led me during latter years into a different channel of reasoning relative to the treatment from which I entertained during former years.

The cystic ovary, which is being considered in this argument, is not the organ which has suffered from a microbic invasion; but the organ which, through adverse influences, reasonably assumed to be mechanical in their nature, has suffered changes in its stroma and epithelial structure that have carried it beyond recognized physiologic limits. Furthermore, this argument is confined to ovaries belonging to unmarried women, ranging from fourteen years to twenty-five years, where the cystic degeneration was discovered during an abdominal section performed for a lesion not in any way associated with the ovary.

The anatomical privileges which the ovary enjoys create opportunities that are particularly prone to bring disaster to the organ. For instance, it is, apart from the fimbriated extremity of the Fallopian tube, the only organ situated within the peritoneal cavity bereft of any peritoneal covering. At its attachment to the broad ligament a jagged line, visible to the naked eye, marks the meeting of the layer of cylindrical epithelium cells of the ovary. This line is arranged like a beautiful mosaic, with those of the flatter endothelium of the peritoneum. Another strange feature of which this small organ can boast, is its lavish and interesting blood supply. The arteries, six to eight in number, running between the folds of the broad ligament, are twisted like a corkscrew.

This appearance is maintained in the stroma itself, in which they are most abundant at the boundary of the parenchyma layer. The veins, akin to the pampiniform plexus, form a dense coil in the hilum and by their size give evidence of great import in promptly relieving the organ of a superfluous blood supply at any time when the physiological balance seems threatened.

A third feature, absolutely devoid of any aid to the organ in the face of impending danger, is the laxity of its connections and its subjugation to the changing relations of the contiguous viscera. The ovary is, in a great measure, dependent for its well-being upon the conduct of its associate, the uterus. Many of the mishaps befalling an ovary can be, indirectly, ascribed to a changed attitude of this organ. It is this changed position of the uterus which is to a great extent, responsible in bringing about a cystic degeneration. Slight as the deviation may be, if maintained for sometime, the ovary, on account of its lax attachments, will be forced into a position not conducive to a normal coping with its blood supply, and an engorgement of the organ will result. This engorgement, unless the uterine deviation should correct itself, will gradually burden the tottering ovary with an additional weight which its meager supports, especially the mesovarium, will not be able to sustain adequately and the organ will suffer a displacement below its normal position. In its descent, owing to its attachment near to the cornual angle of the uterus by the ovarian ligament, the ovary will necessarily be brought nearer to the middle line. The position in which the ovary thus finds itself is an unfortunate one on account of its arterial and venous circulation. It is in this prolapsed state of the ovary that the true pathologic changes first begin to manifest themselves.

In so delicately constructed an organ as the ovary, whose extraordinary function constitutes one of the most puzzling and most interesting problems in physiology, it is reasonable to assume that *drastic* impairments in its vascular supply are not necessary to bring about textural changes. Mild disturbances, if they persist long enough, are all that are required to change normal into abnormal conditions. The whole picture appears to me to be somewhat analogous to the changes the surgeon sees in a partially strangulated intestine. It seems wholly a mechanical condition in which the circulation plays the principal part. Textural changes in the tissues are brought about, not by an inadequate supply of arterial blood, but by an embarrassed venous circulation bordering on stasis. Such changes in an organ as intricate as the ovary, where the growth potentialities of the cells are so astoundingly pronounced, are a consequence of tension and a certain degree of torsion of the mesovarium at its broad ligament attachment. We are all familiar with the consequences of a prolonged hyperemia. The assumption must be granted that a sustained hyperemia of the ovary will, eventually, produce tissue degeneration; and the clinical interpretation must be that inflammatory processes are taking place. This type of inflam-

mation in the ovary, however, is not that of an infectious process; it is rather the outcome of an excessive irritation of the cellular elements stimulated into a hyperactivity. Nevertheless, pathologic changes are engendered, and the individual structures become alike responsive to the morbid impetus.

A general increase in the size of the organ, with a tendency to a globular form, becomes apparent. The tunica albuginea presents a well-marked thickening, and although the stroma cells have not lost their distinctive structure, they have become hyperplastic. The parenchyma also shares with the interstitial tissue changes, and a marked diminution in the number of primordial follicles and an abnormal tendency to atresia become discernible. Furthermore, degenerative changes in the blood-vessels become evident, causing them to appear as hyaline masses. From a histologic point of view, the gland structure presents its most interesting zone immediately below the tunica albuginea, where it is condensed into a kind of cortex, harboring multitudes of small vessels called ovisacs, or the follicles of DeGraaf. In these follicles the ova are developed. The majority of these ovisacs are of microscopic size. However, as they ripen and approach the surface of the ovary, they may attain the size of a large white currant. By an increasing vascular congestion of the ovary, the increased tension in the organ forces the ovisac to the surface. This increased tension causes an interference with the circulation in the follicle resulting in necrotic changes at the stigma, where rupture finally occurs. Normally, rupture of the ovisac leads to scarring of the albuginea, and the empty capsule slowly disappears when impregnation of the ovum has not occurred. However, if fertilization of the ovum does take place, the empty vesicle undergoes a remarkable development under the influence of the increased vascularization of the organ, and a yellow plicated body, known as the corpus luteum, is formed. However, conditions may arise, and they must be ascribed to consequences of hyperemia in a physiologically mature follicle, which failed to rupture, either because the ovum has not progressed toward the free surfaces of the ovary, or because of the ovary, the tunica albuginea, has become thickened through textural changes, which prevented rupture. In such an instance the secretion of the follicles, the liquor folliculi, remains confined within the vesicles, and in this manner gives rise to the formation of a cyst called hydrops folliculorum graafii.

Recent investigators admit that atresia of the follicles, and a certain degree of cystic formation in an ovary during the menstruating period of life, are physiologic. Granting this admission, the

question arises: When has this form of cystic degeneration reached its physiologic limits? The answer must be guarded for the following reasons: 1. Cystic degeneration of an ovary seldom mirrors a definite clinical picture. 2. There is rarely severe pain, and the menstrual disturbances, should there be any, are of the ordinary type. 3. Should there be pain, it must be ascribed either to torsion of the mesovarium, engorgement of the veins of the broad ligaments, or the presence of adhesions. 4. A bimanual vaginal examination, when the ovary is enlarged and lodged in the cul-de-sac, will elicit pain of a sickening character; but the examination will not reveal anything more definite about the organ unless multicystic follicular degeneration has caused the ovary to assume an unusually large size. This is a rather rare occurrence, inasmuch as a hydrops folliculi does not tend to grow indefinitely, like a cystic tumor. It may be stated here that a rectal exploration under anesthesia, with two or three fingers in the bowel, will often prove more satisfactory in these cases, than a vaginal examination. Nevertheless, no matter how thorough and how expert the examination, the pain and tenderness elicited in the ovarian region are not sufficient ground for a positive diagnosis of cystic degeneration.

Referring to my personal experience with this condition, I frankly admit that the diagnosis was invariably made during an abdominal section for lesions other than ovarian. The operations were performed most frequently for chronic lesions of the appendix, or retrodeviation of the uterus. The patients, 200 of them, were all unmarried, varying in age from fourteen to twenty-five years. Although the cystic degeneration was frequently found to affect both ovaries, in the majority of the cases operated upon for chronic appendicitis, the lesion was confined to the right ovary in the ratio of about ten to one. This may be explained on the ground that the chronic inflammatory condition of the appendix precipitated an excessive and prolonged vascular supply in which the ovary was compelled to share on account of its nearness to the appendix. It may be of interest to state that, whenever this condition was encountered, the uterus was frequently found, apparently, in a normal position; at any rate, the retrodeviation was so slight that it could not be considered as pathologic. From this the inference is justifiable that a chronic appendix lesion may invite cystic degeneration of the ovary without concomitant malposition of the uterus. With this preamble concluded, what was done with these cystic ovaries?

It may be of satisfaction to the ultraconservatist to know that

not all of these ovaries were resected, for only about one-half of them offered a pathology which, in my judgment, demanded resection. About one-half of the ovaries not subject to radical surgical procedure, were suspended as close to the cornual uterine angle as possible. In those instances where a malposition of the uterus was present—in the majority of cases it was a retroversion—the displacement was corrected by the simplest operative method; viz., that of shortening the round ligaments, and attaching the reduplication of this structure, with silk, to the anterior surface of the body of the uterus. In no instance of retroverted uterus was it deemed advisable to correct the displacement by operative procedures entailing severe trauma.

The same delicate operative measures were strictly observed in suspending the ovary. No extremes, such as buttonholing the broad ligament and passing the ovary through the slit, thus causing it to lie upon the anterior surface of the ligament (the Mauclaire-Barrows operation), were undertaken. No difficulty was encountered in returning the ovary from its prolapsed position and retaining it in the place selected for it. The ligament of the ovary, a structure composed of unstriped muscular fibers, affords an excellent aid in obtaining this purpose. When the ovarian ligament was found so extremely relaxed that a proper ovarian suspension could not be otherwise obtained, there was no hesitation in carrying the sutures through the sides of the uterine body near the cornual zone. The surgery pertaining to ovarian suspension should be confined to the median portion of the organ, as far remote from its lateral border as is feasible. The anatomical relationship of the fimbriated extremity of the tube and the ovary must be respected, as much as is possible, for physiologic reasons. The tubal mesentery is in close apposition to the tubal surface of the ovary and forms, between these two structures, a slit-shaped peritoneal space, the bursa ovarica. Destruction of this delicate anatomico-physiologic arrangement may create difficulties for the ovum, in gaining entrance into the Fallopian tube.

In those instances where resection was decided upon, the guiding principles were the large number of cysts present. An ovary which showed a moderate amount of cystic degeneration was not resected; but a prolapse or faulty position of the uterus was invariably corrected, and the future fate of the ovary trusted to the correction of the displaced uterus. Sometimes these chance methods have a favorable influence upon the organs, and the existing degenerative process becomes stationary, and remains so. Sometimes, however, and this observation I have made personally, a moderately cystic

ovary, even after the associated conditions have been corrected, will eventually undergo a marked cystic degenerative process and cause the organ to assume proportions so as to make it readily palpable by either vaginal or rectal examination. The inference is clear. It can never be fully ascertained, by simply looking at an ovary undergoing cystic degeneration, to what extent the glandular substance of the organ is affected with these follicular dilatations. When during an abdominal operation an ovary is encountered which presents from five to eight cysts upon its free border, varying in size from a pea to a small hazelnut, which look at you as so many eyes with opaque corneas, that ovary is pathologic and is a proper one for resection. It is only logical to infer that, in instances of this kind, many more cysts are embedded deeper down and throughout the glandular substance of the ovary, and that their presence creates a pressure atrophy of the functional elements with the concomitant inhibitive efficiency of the organ. Simply puncturing these cysts and evacuating the light thin serous fluid, which may, in some cases, be brownish or blood-stained, is a procedure of little promise for an ovary in which cystic degeneration has gone beyond the physiologic limits. This procedure is not to be recommended for cysts projecting above the surface of the ovary, as it carries with it no assurances of good. The smaller cysts, grouped deeper in the glandular substance, where removal during resection is not deemed advisable on account of the great sacrifice of healthy ovarian tissue, may be punctured because the cyst is small, its walls delicate, and, furthermore, because it is the only surgical measure permissible.

An ovarian resection is a surgical procedure which requires earnest consideration. Unless this is fully appreciated, an ovary had better not be attacked. The harmful consequences following a surgical attack upon an ovary are not the result of a complicated or trying technic. An ovarian resection is the simplest of operative measures. The harmful consequences are usually the result of carelessness in the technic. It must be borne in mind that the ovary is not covered with peritoneum, except at the mesovarium, and that the organ is in contact with omentum and hollow viscera. The tendencies to the formation of adhesions in pelvic surgery are well known; means to prevent them are also fairly well understood; but, unfortunately, the earnest detail which carries with it the potent factor is often neglected. As a result, favorable conditions for pain, which have not previously existed, are being created. To make myself clear, an adhesion with the small intestine, or omentum, may occur with the minutest exposure of ovarian tissue at the site of resection.

In performing a resection properly, it is advisable to grasp the organ between thumb and index-finger of the left hand, and hold it securely rather than grasp it with a forceps and traumatize its structure. The incision is made with a very sharp knife, and a wedge excised at the most prominent part of the ovary. The cystic zone is included in its entirety, if possible. When the wedge is excised, the physician should see that the lateral portions of the ovary will meet in good apposition when the sutures are being placed. The apex of the wedge is carried close to the hilum so that a generous exposure of the internal architecture of the gland may be obtained. Bleeding may be considerable, but it is easily controlled by exercising pressure at the hilum of the organ with the thumb and forefinger.

A search for dilated follicles in the lateral segments is advisable, and the simplest manner of obtaining positive results is to cross-section each segment by one or several well-placed incisions. If cysts are encountered, they may be punctured or excised, according to their size or the ease with which they can be removed. The suturing of a resected ovary should be done carefully and with neatness, enough tension being exerted upon the sutures to insure hemostasis and good apposition of the wound. A round cambric needle, threaded with No. o iodized catgut, will answer the purpose admirably. The interrupted mattress sutures are placed through the body of the ovary. A simple running suture is used to unite the margin of the wound. The latter is a very important step in the operation. To make certain that no adhesions to neighboring viscera can take place, cover the suture line with peritoneum borrowed from the broad ligament. This is done by simply hooding the mesosalpinx over the suture line and securing it with two or three catgut sutures.

Conclusions: Without an abnormal position of the uterus, be it a retrodeviation or a descensus due to ligamentous relaxation, there is seldom a prolapsus of the ovary; without prolapsus of the ovary, there is no abnormal hyperemia; and without an abnormal hyperemia, cystic degeneration of the ovary is rare.

CHRONIC OOPHORITIS AND THE CYSTIC OVARY.

BY

OTTO H. SCHWARZ, M. D.,

St. Louis, Mo.

In studying a series of ovaries removed at operation, my attention had been attracted chiefly to two conditions, chronic oophoritis and the cystic ovary. In considering chronic oophoritis, the chief points which were taken up were the frequeny with which it occurred, the degree in which the inflammatory process involved the ovary, its effect on the ovary as a whole, its association with other pelvic inflammatory diseases, and the possibility of it being an infection of hematogeneous origin. In studying the cystic ovary, the condition under which this lesion occurred was first considered, particularly, whether it occurred most frequently in the presence or absence of pelvic inflammatory lesions. Also whether or not there was present in the ovary evidence of inflammatory disease or a residual condition which could be attributed to a previous inflammation. Considerable attention was given to the presence of a chronic passive congestion and edema in these ovaries.

Chronic oophoritis, as the name implies, necessarily means a chronic inflammatory process of the ovary. It should embrace only such lesions which can be definitely attributed to the effects of inflammation. It is almost always secondary to an infection of the tube and, therefore, most frequently of gonorrheal origin. Infection from a puerperal origin is also frequent.

Some authorities seem to differ as to the frequency of these two types of infection. Frankl(1) considers the gonorrheal the most frequent. Craves(2) on the other hand, considers the lesion to be most often the result of previous puerperal infection, and mentions the streptococcus as the most frequent offender. Gonorrheal infection is almost always transmitted to the surface of the ovary by pus escaping from the fimbriated end of the tubes. The streptococcic infection may be transmitted in the same manner. Other modes of infection are from the uterus by way of the lymphatics, directly to the ovary by a pelvic peritonitis, or through the blood stream. Frankl mentions the occurrence of ovarian abscesses as the result of hematogeneous infection. These were cases where

there was absolutely no evidence of other pelvic infection, and could be attributed as secondary to the presence of tonsillar abscesses.

Recently, C. H. Davis(3) cultured 65 ovaries removed at operation and isolated the streptococcus viridans in 50 per cent. of the cases. Salpingitis occurred only 11 times in the series. In 52 cases, in which ovaries showed fibrocystic change, streptococci were isolated 30 times. In his conclusions he states that his study shows that bacteria must also be regarded as the cause of chronic oophoritis; under this condition he evidently includes fibrocystic degeneration.

Davis(4), in a similar previous contribution, in association with Rosenow, concludes that fibrocystic degeneration of the ovary, in the absence of a previous acute infection, is commonly due to a low grade hematogeneous infection through streptococci which have an elective affinity for these structures. These authors feel justified in concluding that their findings, in cases where there is no history of acute infection, would indicate that infection in the ovary of hematogeneous origin occurs more frequently than is generally believed.

Wiener(5), recently reported a case which may be considered of hematogeneous origin. He states that the theory of hematogeneous infection with streptococcus viridans, as the cause of fibrocystic degeneraton, has not yet been substantiated by other observers. He speaks of the desirability of studying and reporting similar cases, and believes that in this manner the frequency or rarity of this condition can be established.

In the description of chronic oophoritis, most authorities agree that the periovarian adhesions, with sclerotic changes in the ovary, are most characteristic. The stroma is usually dense with fibrous tissue increase and obliterative endartertitis of the vessels, sometimes the latter is present in a marked degree. The follicles, both primordial and developing, are markedly diminished and frequently absent. Fibrocystic changes occur in some instances. This fibrocystic change is possibly due to the remote results of a previous inflammatory process; but, as this condition frequently occurs in ovaries that are freely movable and without adhesions, it is rather difficult to determine this in many cases. Frankl states that cyst-formation readily takes place in ovaries in which there is an inflammatory process; but, in a majority of cases of microcystic degeneration of the ovary, he is unable to find any evidence of the existence of a previous inflammation.

Findley(6) published, in 1904, a paper which included a review of the literature and a study of 180 cystic ovaries. Of these thirty-

nine were found uncomplicated. They were chiefly associated with uterine myomata and salpingitis; these conditions were present respectively, in fourteen and fifteen per cent. of the cases. He mentions as a common factor in the production of the cystic ovary the presence of chronic passive congestion; due in many instances, to the presence of varicose veins in the broad ligament. Findley believes that this congestion could readily lead to hydrops of the follicle and that the hyperplasia of the stroma would hinder the bursting of the follicle. Scarcity of normal follicles was a prominent feature in his cases. In a few sections no follicles were found and, in nearly all, they were fewer in number than in normal conditions. Findley explains this finding as the result of atresia brought about by the addition of new connective tissue in the stroma and by its subsequent contraction. Hyaline change in the blood vessels was one of his frequent findings and round cell infiltration of the stroma appeared also in many instances. Findley concludes that cystic degeneration of the ovary is almost invariably the result of chronic oophoritis which in turn is caused by infection or a passive congestion and is, therefore, a morbid lesion. He further emphasizes that one or more ripened follicles in the ovary are not to be mistaken for cystic degeneration.

Frankl(7) describes microcystic degeneration of the ovary, as an ovary which contains numerous small cysts varying in size from a hemp seed to that of a hazelnut, which partly jut from the surface of the ovary and have a glistening appearance due to their clear fluid contents. He asserts that this condition was formerly considered the result of chronic oophoritis and that he found it almost constantly associated with chronic congestion. Frankl quotes Meyer as emphasizing the same point and giving the exceedingly plausible explanation that, as a result of the hyperemia, numerous follicles become enlarged. Under the influence of a matured follicle, the remaining, growing follicles are checked and undergo atresia. Cystic atresia of the enlarged follicles also takes place. Disappearance of the ovum, degeneration of the theca, gradual involution of the granulosa, with only small traces remaining, are the chief histological characteristics.

The stroma in these ovaries, Frankl maintains, is usually diminished. In occasional cases the stroma is dense and rich in connective tissue; this, he explains, is the result of hyperemia. He also declares that, if there are a few or only one follicle which become cystic, under the influence of the marked hyperemia of the perifollicular vessels, they may enlarge to the size of a walnut and

even larger. That retention cysts occur in association with inflammatory disease, Frankl does not deny; but claims that the presence of cystic follicles is the result of inflammatory hyperemia, rather than mechanical obstruction.

My personal study includes a series of 80 cases in which one or both ovaries were removed at operation. With few exceptions, the removal of the ovaries was secondary; they were either diseased themselves in association with more serious pelvic lesion, or were removed in the course of a hysterectomy. When the ovary was removed for a new growth, it was not included in the series.

In going over these specimens, a diagnosis of chronic oophoritis was made in twenty-four cases. Sixteen of these cases were operated on for chronic adnexal inflammatory conditions. In all of these cases there were marked inflammatory process in the tubes. The ovaries were densely adherent to the tubes; in some instances it was very difficult to recognize them, so intimate was the connection between them. The ovaries were enlarged in ten of these cases; the enlargement was rather moderate, but several instances they attained the size of a hens' eggs, but no larger. Six of the ovaries were of normal size; some, perhaps, a little smaller. Microscopic examination of the tubes in all of these showed marked chronic salpingitis.

In the eight remaining cases, uterine myomata were present. These were, for the most part, rather small myomata. In two of these cases the ovaries were markedly adherent to a chronically inflamed tube; in the others, there was only slight evidence of plevic inflammation; but the tubes, with one exception, showed a definite chronic inflammation on microscopic section. The one case which showed no tubual inflammation had a definite chronic inflammatory process of the endometrium and within the uterine wall.

Histologically, these specimens show about the same picture. The inflammatory processes involved chiefly the periphery of the ovary and ovarian stroma. Periovarian adhesions were frequently found, which consisted of a fibrinous deposit mixed with small round cells. In some cases this exudate was loosely attached; in others, it was intimately connected with the albuginea. The tunica albuginea was definitely thickened; in some cases the thickening consisted of a band of dense fibrous tissue, rather rich in cells; in other instances, the change appeared to be hyaline in character. Occasionally it was of a marked edematous appearance. The stroma of the ovary was in all cases very dense and as a rule, formed a conspicuous part of the ovary. The follicles, both developing

and primordial, were not abundant. In most instances the follicles were decidedly diminished and occasionally, none were recognized. In this group of cases, there were four in which the patient was over 40 years of age; considering this the effect on the following system seems very striking.

Sclerotic changes in the vessels were frequently observed; almost all the ovaries showed this to some degree. The changes were most marked in the smaller vessels, many having thickened hyaline walls with narrowed lumina; others, showing complete obliteration. In the more marked chronic inflammations, particularly in the cases in which the patients advanced in years, the sclerotic process involved all vessels to a greater or less degree. Small round cell infiltration was found in every case, in fact, in making our diagnosis great stress was placed on the presence of these cells. They were found most frequently in the albuginea, either diffusely scattered, or in groups and invading the stroma on some occasions. They were also frequently found in the hilus surrounding the vessels and scattered throughout the loose connective tissue there. Occasionally they were seen in increased numbers about a corpus luteum or a maturing follicle and in some instances, invaded their cavities. In only four of the ovaries, which showed definite inflammation, were there retention cysts. These cases will be discussed in connection with cystic ovaries.

In this series there were twenty-five cases in which cystic ovaries were found. Under this head were included those which were considered retention cysts of the Graafian follicle. Seventeen of the cases were of the microcystic type; eight were monocystic. The cyst cavity in the latter varied from two to nine cm. in diameter. In only eight of these twenty-five cases was there evidence of an associated pelvic inflammatory disease and in four of them chronic oophoritis was found. This relation is in marked contrast to that found in the cases of chronic oophoritis;—myomata of the uterus occurred fourteen times, and was the most frequent accompanying condition.

The stroma was markedly diminished in nearly every case; it being under the pressure of the enlarged follicles. In four cases the stroma was very dense; in all of them a diagnosis of chronic oophoritis had been made. Round cell infiltration was present in these inflammatory cases and in two others of the same group. In the latter two instances it was very slight and was not accompanied by changes in the stroma.

In order to detect a possible increase in fibrous tissue in these

sections, ten of the most typical of the microcystic type sections received the Van Gieson stain. In only one, was there a definite increase in the fibrous tissue. The cystic cavities were mostly lined with granulosa cells; in many instances, the granulosa had a healthy appearance; particularly in the smaller cysts. The granulosa was also found in all stages of degeneration and, frequently, it had entirely disappeared. This latter finding was, almost without exception, true of the larger cysts.

The most constant finding was venous congestion; it occurred practically in all cases and was particularly marked in the perifollicular vessels and in the larger vessels of the hilus. The small vessels throughout the ovary were often distended with blood. Edema, too, was frequently found. The lymphatics in the hilus, as a rule, were greatly dilated. The ovary itself was frequently found edematous; this was chiefly noticed in the medullary connective tissue and in the tunica albuginea.

The developing follicles were very scant in almost all cases. In the ovaries of the younger patients this may be the result of pressure from the distended follicles on the cortex. Sclerosis of the vessels in the ovaries from younger women, was not a frequent finding. It occurred, of course, not infrequently in the ovaries of patients past the age of forty, which represents about half the cases in this group.

It would appear from this rather brief study, that chronic oophoritis is almost always secondary to other pelvic inflammatory diseases; it is associated with chronic salpingitis almost in all cases. That hematogeneous infections of the ovary occur cannot be denied; well reported cases in the literature speak for this. The frequency or rarity of the latter, however, is yet to be established.

Cystic degeneration of the ovary was found most frequently in cases of a non-inflammatory character. In a considerable majority of cases, there were no changes in the ovary which could be attributed inflammatory conditions. Small round cell infiltration, one of the usual findings in chronic inflammation, was not in evidence.

REFERENCES.

1. O. Frankl. Liepman's "Handbuch," Bd. ii, page 188.
2. W. W. Graves. *Graves* Gynecology, 2d Ed.
3. C. H. Davis. *Surg., Gyn. and Obst.*, vol. xxiii, No. 5., page 560.
4. C. H. Davis. *Jour. Am. Med. Ass'n*, 1916, vol. xlvi, page 1175.
5. S. Weinner. *Surg., Gyn. and Obst.*, vol. xxvii, No. 6.
6. P. Findley. Amer. Jour. of Obst., vol. xlix, page 762, 1904.
7. O. Frankl. Liepman's Handbuch, Bd. ii, page 194.

CASE REPORTS.

BY

ARTHUR T. JONES, M. D., F. A. C. S.,

Providence, Rhode Island.

Case I.— Emily R., aged 63, white. Previous history: mother of three children, oldest thirty-five years, youngest twenty-four years.

Present illness: She has been aware of the presence of an abdominal tumor for many years. Of late it has grown rapidly.

Physical examination shows presence of enormous tumor; percussion wave marked. Diagnosis: ovarian cyst. Advice: operation.

Operation January 11, 1917. Median incision was made from pubes to ensiform: tumor, which was enormous cyst of right ovary, was removed without difficulty. Appendix, large, and was removed. The incision was closed in layers, by the usual method. The tumor contained 43 pints of fluid and with sac, weighed 50 pounds. Patient made good ether recovery. Twenty-four hours after operation, patient passed large amount of blood followed by long, large casts of the bowel, some of which were from ten to twelve inches in length. Bloody stools persisted for 3 to 4 days, and patient continued to pass casts and shreds. General condition was very fair, although the bleeding from rectum seemed rather serious at times. Condition gradually cleared, however, and patient made an uninterrupted recovery. Discharged seventeen days following operation. Well.

This case was of interest not only because of the size of the cyst, a condition which is seldom allowed to continue to such extremes, but also because of the complication of bloody stools and the passing of mucous and epithelial casts of the intestine, which I accounted for as due to the relief of the tremendous pressure to which the intestine had been subjected while the patient had been carrying her tumor. The cyst was not malignant, and the patient developed no evidences of malignancy following. She has since died as her family doctor expressed it, of "general breakdown," although he states there was no evidence of malignancy causing her death.

Case II—Beatrice J., aged twenty-one. February 15, 1912.

Previous history: Inquiry shows that patient's abdomen was rather large and prominent for a long time before pregnancy.

Present illness: First pregnancy. Duration, seven months. Labor began two days ago. Pains at regular intervals. Her family physician was called the day before, and found cervix obliterated; os slightly dilated. Child's head well into pelvis. Fundus of uterus high up on left side. Right side of abdomen occupied by large fluctuating tumor. No indications for interference. Next

day, hard uterine pains; no progress of labor, evidently owing to obstruction from tumor. Operation decided upon.

Patient taken to hospital. Laparotomy. Median incision. Large cyst of right par ovarium was delivered and removed. Uterus was then incised and live child delivered, placenta removed, and uterus closed in two layers. Abdominal incision closed in layers. Patient made uninterrupted recovery; child showed marked icterus for some days following delivery. Temperature ranging from normal to 103–104, as the mother was unable to nurse child, it was put on artificial feeding. Child had some breaking down of skin and had ulcerated areas over body. This condition cleared up, and the baby is now apparently a healthy, well-nourished child.

This case was of interest from the fact that we had a large cyst which was obstructing labor, and there seemed no alternative but to laparotomize this patient. Following the removal of tumor the only wise procedure seemed to be toper form a Ceserean section, as we could not expect nature to terminate the labor under the existing circumstances. There was no specific history in the family, and the condition of the child following delivery was, evidently, due to malnutrition and circulatory disturbances.

Case III.—Clara K. aged thirty-two; previous history: married eleven years, no pregnancies.

Present illness: A small growth was noticed five years ago in right inguinal region, not painful; but patient complains of nausea; no vomiting.

Physical examination shows tumor in right inguinal region size of English walnut, freely movable, not painful, not reducible.

Diagnosis: Either omental hernia or enlarged gland.

Operation May 28, 1919. Tumor found hard and fibrous in appearance, and attached to distal end of round ligament. Latter was dissected to the internal ring. Peritoneum was opened at internal ring. Uterus palpated, found to contain small fibroid on posterior wall, low down near the cervix. Both appendages adherent to underside of broad ligaments; ovaries sclerotic, tumor with portion of round ligament cut away. Peritoneum at internal ring closed; internal ring closed about the round ligament. Latter stitched between edges of external oblique muscle as in Alexander operation. Incision closed. Uneventful recovery.

Pathological report: Fibroma of round ligament.

This case was interesting on account of simulating omental hernia or an enlarged inguinal gland, and thus proving to be a fibroid tumor of the round ligament, which is not frequent in occurrence. This is the first case I have met in my operative work. Few cases of this kind are spoken of in the literature. Kelley states that "fibromata and myomata are rare in the distal portions of the ligament, but the latter are frequently found a short distance from the uterus, but are probably often misplaced there. The condition is so rarely met with that one would be apt to confound it with hernia or adentitis.

DISCUSSION ON THE PAPERS OF DRS. REDER, O. H. SCHWARZ AND JONES.

Dr. Albert Goldspohn, Chicago, Illinois.—Mr. President: To find histological evidences of infection in the ovaries of those patients who give a history of infection, is to be expected, and hardly needs further discussion. But we find these troublesome retention follicle cysts in many patients who give no clinical evidence of having been infected in any way; and yet they are subjects of clear, unmistakable suffering. The histological studies which Dr. Schwarz is making are much needed in the ovaries of such cases to determine how far such follicle cysts are physiological, and when, or how frequently they are pathological. Most investigators of this subject, I believe, have found that the ovule soon dies in such enlarged and painful follicles, and that other evidence of degeneration is found in them. I believe that the connective-tissue hyperplasia in the coat and in parts of the stroma of the ovary and the resulting degeneration of Graafian follicles into retention cysts in such non-infected cases, is mostly due to long and persistent venous hyperemia in the environment of the ovary. It is found mostly in connection with pronounced retroversion or retroflexion of the uterus, not so much with plain decensus of the same. In these retrodeviations of the uterus the web of broad ligament becomes twisted, and tention upon it is increased so that some degree of impediment to the return current in the veins must result. Persistent passive hyperemia results in connective-tissue hyperplasia in many other places in the body; for instance, it increases in the bronchi and in the liver in cases of marked and persistent valvular heart disease. It increases in the walls of varicose veins and in their surroundings. And when these subtle changes and some pain occur in a man's varicose scrotum, they easily and frequently cause him much concern, if not anxiety. But, as the female scrotum is inside of the body and out of sight, these conditions and their results are not so well appreciated in women.

The discomforts and pains that women have from retroversion of the uterus, etc., are caused more by these conditions in the associated descended ovaries than by the uterus itself. If women had no ovaries, the displacement of the uterus would be a more indifferent matter, perhaps consistent with the view of those gentlemen to whom every and any position of the uterus is a normal one as long as it remains within the body.

Dr. Hugo O. Pantzer, Indianapolis, Indiana.—The subjects presented this morning are of unusual interest. It is revealed how little penetrating, as yet, is our reasoning on pathology. We have been floating complacently along conventional clinical courses! The broader concept of hematogenic infection must formulate new and fuller concepts of pathology. For example, we still speak finally of displacement of the uterus as causing congestion of this organ, whereas the additional hematogenic infection to which it disposes really only imparts to such congestion its dominant clinical significance. In likewise the traumatism of the ovary at the time an ovum is set free, and of the endometrium when menstruation causes

rhexis of its vessel, develops into incisive clinical issue when by hematogenic sources an infection takes place in these tissues. Gottschalk, one hundred years ago, had observed amenorrhea to prevail in young girls after having suffered severe epidemic diseases. And the profession of to-day—even as does the laity—speaks of a "cold" at the menstrual period being attended and followed by pelvic disturbances without clear conception of the pathologic changes prevailing within these organs. It is here that painstaking investigations, such as Dr. Schwartz meritfully reported here today, shall come in to give us the true, fundamental basis for clinical concepts and remedial courses.

I wish to refer to one case before closing. A woman married 17 years without ever having become pregnant, had suffered dysmenorrhea all her sexual life. When she first presented herself to me she entertained hopes that amenorrhea of the last four months, though attended without painful menstrual molina, might indicate a pregnancy. Examination revealed no pregnancy. Very small sclerotic, seemingly hopeless ovaries were found. It was decided to operate for their removal. During the operation, after one ovary had been removed and this organ had been split longitudinally there was revealed below the thickened albuginea a small ledge of relatively normal tissues which suggested further germinal activity might be possible. Thereupon the thickened albuginea of the *other* ovary was pared off and, more, to assure relief from the constriction of the remaining albuginea, the ovary was split longitudinally and resewed by a few uninterrupted lightly drawn sutures. This patient hereafter menstruated regularly a few times; then amenorrhea prevailed. She returned to me with this report. My examination revealed her pregnant four months! This pregnancy continued to full term and ended in the birth of a fine living child. The case is cited as affording the theoretical warrant for further conservatism in the treatment of such cases. It should stimulate speculation and research into the pathology of similar cases.

Dr. Abraham J. Rongy, New York City.—I thought that the question of cystic ovary had long been forgotten. After listening to these papers I thought that we were holding a wake to the cystic ovary that had been forgotten fifteen years ago.

Regarding the cystic ovary, a gynecologist in New York City put forth a very good maxim when he said that he would rather be a snow-ball in hell than a cystic ovary in New York. (Laughter.) A cystic ovary must not be operated on unless there are clinical symptoms produced by it. What are these clinical symptoms? Disturbed menstruation and pain. If disturbed menstruation and pain are not present in a patient having a cystic ovary, it should be left alone. As we do not touch the thyroid surgically because it is cystic and slightly enlarged, so should we not suggest operation on a cystic ovary when it gives no symptoms.

The cystic ovary probably has its origin in some disturbed internal secretion, as pointed out by Dr. Sanes. Before deciding on operation in this class of cases we should try some endocrine

therapy, either ovarian substance, or a combination of it with thyroid.

Dr. K. Isadore Sanes, Pittsburgh, Pennsylvania.—In some cases the conservation of a small piece of an ovary is a source of great satisfaction. I recall the case of a young prostitute, who had bilateral tubo-ovarian abscesses. The tube and ovary on the left side were completely removed. The tube and the greater part of the ovary on the other side were also removed; just a mere shell of the ovary was left. I covered with it the right cornu. A month later the woman developed abdominal pain, for which she consulted me about three months later. I found her pregnant, and subsequently she gave birth to a living child. She had had gonorrhea and syphilis. The child was syphilitic and tubercular. However, the child is still living and is now eight years of age. Of course, the conserved portions of ovaries once in a while get the patients into trouble. I have had to remove cysts that had developed in such ovaries.

As to the cysts complicating labor: about twelve years ago I reported a case, in the American Journal of Obstetrics and Diseases of Women, of labor complicated by an obstructing ovarian cyst. I opened the posterior cul-de-sac, took hold of the cyst with two forceps, introduced a trocar, and gradually emptied the cyst contents. Then I pulled the ovarian cyst down, ligated it off, closed the posterior cul-de-sac, and delivered the child with forceps. Both mother and child are living.

Dr. James E. King, Buffalo, New York.—The question of dealing with the cystic ovary is one every operator must decide according to his experience, and his conception of what constitutes the cystic ovary.

I am not convinced that passive congestion is responsible for all the cystic ovaries. I have found many ovaries which not only in their appearance, but also symptomatically were normal, despite the presence of decided varicose condition of the veins of the broad ligaments. Therefore, I have come to the conclusion from my own experience that there must be other factors in conjunction with congestion that causes the presence of these cystic ovaries. If we do not regard all these cystic conditions as pathologic, there must be undoubtedly a line of demarcation between the normal cystic ovary and the pathological, and to my own satisfaction I have settled that point very much as Dr. Rongy has. If upon examination pressure upon the enlarged ovary causes pain, it seems to me that clearly points to its being a patholgical ovary. If we find such an ovary on operation, and it has not given symptoms, unless it be very much enlarged, it should be left alone.

Regarding the method of suturing, my experience with these cases has been unfortunate in dealing with them by ordinary suture. I have found with Dr. Sanes that these cases have returned to me for two reasons, first because of adhesions of the portion of ovary which is not removed, and second because the portion of ovary remaining becomes cystic. I have adopted a method of suturing

during the past two years which has given me satisfaction. Unfortunately or, perhaps, fortunately, none of these cases have yet returned for a second laparotomy, so that I have not been able to observe the results. In resecting these ovaries, after having removed the cystic portion, instead of sutures through the ovarian substance, I pass a fine needle threaded with catgut through the hilus of the ovary, tying the suture around the ovarian substance, bringing the two surfaces in almost perfect apposition. The puncture made by the needle and suture hole is a potent factor, I think, in producing the adhesions which so commonly follow resection of these ovaries.

Dr. James E. Davis, Detroit, Michigan.—Every operator ought to be required to study sections of the ovaries that he removes. It is my opportunity to examine perhaps about two thousand tissue sections per year, and, excepting the tonsil, there is no tissue removed at the operating table so frequently in which there is no pathology found as in the ovary, that is, judging from the criteria that pathologists use up to the present time. The evidence, at least in the vast majority of sections, points to the conditions that have been pointed out in the papers, namely, there is no essential change in the ovary except the periovaritis. The changes have been noted in the follicles, in the corpora lutea, and in the blood vessels. This organ is a decidual one, and we have great difficulty in determining just the particular period in its history when it begins its rapid decidual change. It is a difficult thing to determine from the standpoint of the pathologist just why so many of these ovaries are removed where there is no valid reason for their removel.

Dr. Robert T. Morris, New York City.—We have not heard enough to-day about what Mr. Lane has had to say on this subject. While Mr. Lane is considered visionary, and what he says is discredited in some quarters, yet he has made a number of very good observations. Mr. Lane laid great stress on the cystic ovary as being of toxic origin. Some cystic ovaries are. In making studies of the cystic ovary it is necessary for us to hunt up all hostile foci of infection in that patient. The internal secretion of the ovary is part and parcel of the secretion of other endocrine glands. When one gland is out of order and we have a cystic ovary to deal with, we should make a study of the whole endocrine system, otherwise we shall not be doing the right thing by our patients and not giving the right expression to this subject before this body.

There are many patients with thyroid disturbance, many patients with focal infections who need to have an infected tooth or infected teeth taken out, instead of the ovary. With an infected tooth out the cystic ovary may become normal. That is an extreme instance, of course, but it is true.

We have cases in which there is colonic disturbance, and toxic influences proceeding from the colon may involve the ovary. The cystic ovary may be a transient affair. The condition comes and goes. I have known hard working women to have cystic ovaries in winter time, sometimes a simple cyst as large as a pigeon's egg,

and during the summer time when they were on vacation they never had this complication. We must give Mr. Lane credit for making this particular observation, no matter how we discredit some of his other observations.

Dr. Reder (closing the discussion on his part).—I have been very much pleased with the discussion regarding cystic ovaries. There is no definite clinical picture as far as the cystic ovary in itself is concerned. Every woman suffers more or less from menstrual disturbances. Many of these are not of ovarian origin. It must be assumed, and with some conviction, that an ovary undergoing cystic degeneration, is a pathologic organ, and that although the organ gives no definite evidence of disease, it is only logical to conclude that an insidious distraction of the glandular substance is taking place.

AN EARLY CASE OF ADENOMYOMA OF THE RECTO-VAGINAL SEPTUM AND AN ADENOMYOMA OF THE OVARY.

BY

OTTO H. SCHWARZ, M. D.,

St. Louis, Mo.

(With ten illustrations.)

My interest in adenomyomata of extra-uterine origin has recently been greatly increased by encountering two unusual cases. One is an adenomyoma found in the recto-vaginal septum, the other an adenomyoma of the ovary. The tumor of the recto-vaginal septum is of particular importance because it represents the new growth in its earliest stage, and it brings up the possibility of recognizing this type of tumor, clinically, at this early period. The adenomyoma of the ovary is a most unusual growth; only a few well described cases have been reported in the literature. One of these is well illustrated and is reported by Russel of this country. I shall refer to his work later.

Adenomyomata of the recto-vaginal septum require no introduction. They have been thoroughly studied by Lockyer of England, and Cullen of this country. Lockyer(8), in his latest publication, goes into considerable detail on the subject of extra-uterine adenomyomata, giving special attention to those occurring in the recto-vaginal space. After a thorough search through the literature, he found forty-seven cases reported in which four of Cullen's cases are included. Cullen has contributed many articles on this subject within the last five years, the most important of which appeared in November, 1917(1).

In this article he reports four additional cases; the case histories and descriptions being given with unusual care and in great details. These are supported by remarkable drawings and by photomicrographs which have no comparison. In his latest contribution "The Distribution of Adenomyomata," which appeared in August, 1919(2), while considering those of the recto-vaginal septum, he states that he has met to date the total of fifteen cases. Heineberg,

PHOTOMICROGRAPH No. 1.—Adenomyoma of Ovary: Cross section of ovary. Large cystic cavity, in upper half cystic Graafian follicle; the irregular cavity in the left central portion of the section is a corpus luteum; in extreme lower portion, and occupying the lower third, are two cavities surrounded by a solid tissue, adenomyoma, which is well demarcated from the rest of the stroma. The next illustration will take up this area in more detail.

in April, 1910(3), reviewed briefly the work of Cullen and Lockyer, and reports two of his own cases.

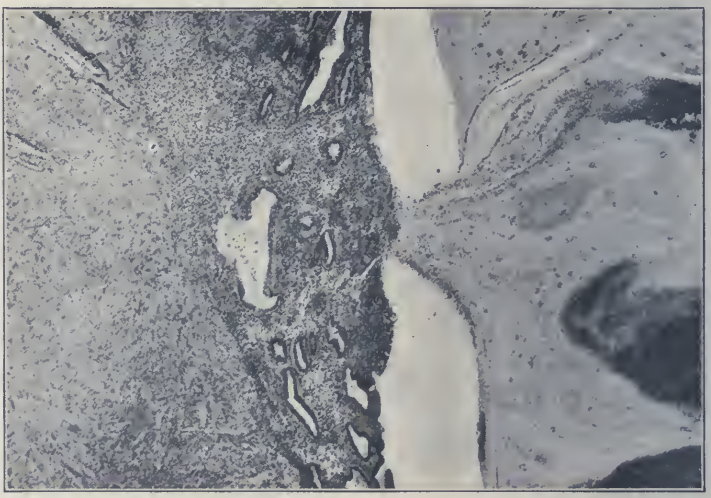
As my case deals with the growth in a very early stage, I shall

PHOTOMICROGRAPH No. 2.—Adenomyoma of Ovary: The solid tissue, containing two large cavities, well demarcated from the normal ovarian tissue, is well shown in the left lower two-thirds of the picture; the solid portion is made up chiefly of smooth muscle; the cysts are lined with tissue similar to endometrium. The upper and smaller cyst still contains some of its contents, which consists of fibrinous material mixed with red blood cells; this material is attached to the lining from which it is escaping. In the lower right portion of the cavity can be seen a definite group of glands; in upper right portion, of the larger cavity, is seen a similar group of glands.

emphasize some of the chief points, brought out by Cullen, in regard to the growth at this period. He describes this group under his

first subdivision, namely, "Small adenomyomata lying free in the recto-vaginal septum." Adenomyomata of the recto-vaginal septum usually start just behind the cervix; and, on bimanual examination, one can feel in this region a small, somewhat movable nodule scarcely over a centimeter in diameter. The rectal mucosa can, at this stage, be readily made to slide over the tumor. The clinical findings in my case fulfill exactly these conditions.

Adenomyoma occurring in the ovary is amost unusual condition. Cullen, in his latest publication on these tumors, mentions the case of Russel reported in 1899(4), which is one of the first cases, if not



PHOTOMICROGRAPH No. 3.—Adenomyoma of Ovary: Lining of cavity on left in Fig. 2. shows a single layer of lining cells; a bloody fibrinous material is attached to it; the lining is continuous with fibrinous material in the cavity. Endometrium like glands are embedded in an endometrium like stroma, supported on a definite muscle tissue base similar to uterine muscle.

the first, reported in literature. This is the best described and illustrated case in the literature. Recently, Cullen has seen two similar cases, one or which is to be reported at a later date.

In 1905, Pick(5) describes four cases of his own, which answer the description of adenomyomata. In these ovaries he found small cystic cavities lined with tissues similar to endometrium and, in some instances, representing endometrium in a state of hyperplasia. All the cavities contained a chocolate brown or bloody material. Pick states that this type of tissue has been previously found in the ovary by Von Franque, S. Newman, Vassmer and Russel. On

account of the similarity of these tissues to the endometrium, he named the condition "Adenoma Ovarii Endometroides." Koch(6) 1911, describes an additional case similar to those described by Pick.

Russel was the first to consider these as aberrant Mullerian structures, or, in other words, of the same origin as maintained by Cullen, adenomyomata of other pelvic locations. On account of the similarity of Russel's case and my own, I here quote the description of his case.

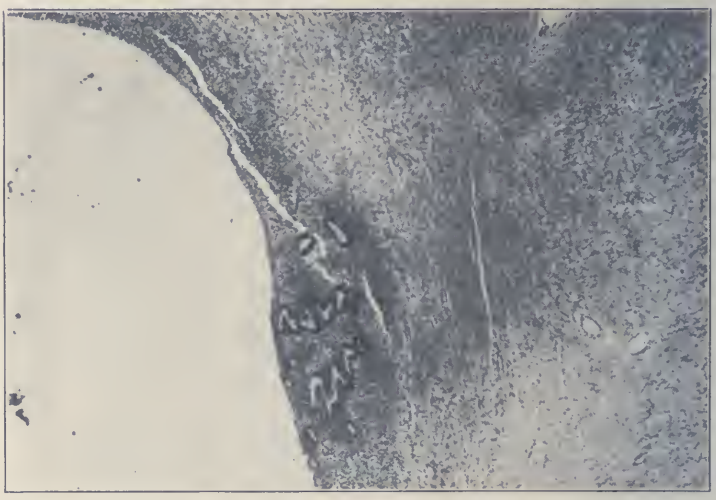
"The ovary was removed in a course of operation for cystic carcinoma of the left ovary. Nothing unusual was noticed about the

PHOTOMICROGRAPH No. 4.—Adenomyoma of Ovary: Higher power of photomicrograph No. 3; shows glands, stroma, and muscle in more detail.

ovary, it being of the normal size, the outer pole cystic and the surface covered with shreds of adhesions. On microscopic study, areas were found which were the exact prototype of uterine glands and interglandular stroma. On examining serial sections, similar areas were found scattered throughout the ovary; the endometrium like tissue, in some instances, being surrounded by nonstriated muscle tissue. On the posterior surface, a considerable distance from the hilus, was a shallow groove partly filled with glands of the uterine type opening on the abdominal side. The epithelium covering this group gradually merged into a single layer of columnar cells. A large corpus luteum, which occupied the outer pole, was two-thirds surrounded by a narrow space lined with columnar epithelium.

In places this lining, dipped down into the tissues beneath, formed a gland-like structure.

"In the substance of the ovary were spaces lined with columnar epithelium which, in places, have distinct cilia. Beneath this was a band of glands embedded in connective tissue. The glands were arranged as in the normal uterine mucous membrane and opened into spaces, their epithelium being continuous with its lining membrane. The interglandular connective tissue was composed of small cells with darkly staining oval and round nuclei, almost completely filling the cell body, in fact, identical with that found in the uterus.



PHOTOMICROGRAPH No. 5.—Adenomyoma of Ovary: Lining of cavity on right in photomicrograph No. 2 shows typical uterine glands and stoma on a definite muscle tissue base. The lining cells are seen along the lower portion of the cavity in this picture. They are absent in the upper half.

Beneath the spaces were bundles of muscle arranged, more or less concentrically with strands running off into the ovarian tissue.

"Leucocytes and red blood corpuscles with indistinct outline partly fill the spaces. The whole form an exact reproduction of the uterine mucous membrane and muscle. The arrangement of these structures gave the impression that they were a continuous system from the groove on the posterior surface. The hilum did not contain any glandular structures, but appeared normal except for sclerosis of the vessels."

CASE I.—*Adenomyoma of the Rectovaginal Septum.*—Patient, E. L. F., aged thirty-five. Admitted 4-19-19. Gynecological

No. 1865. Chief complaint, painful menstruation and passing of clots. Family history, negative. Past history, usual childhood diseases, no sequelæ. Typhoid at the age of twelve; has been troubled by nasal catarrh since childhood. Chronic constipation for twenty years. No accidents. No operations.

Menstrual history: Began at twelfth year; every twenty-eight days; duration from three to four days. Pain from the onset to the end of the flow. Last period 4-1-19. Present illness: Has always had painful menstruation and always passed clots. Menses have been more profuse during the last year, but without increase of pain. Her health gradually failed, and she wondered if the genital organs

PHOTOMICROGRAPH No. 6.—Adenomyoma of Ovary: Lining of cavity shown in photomicrograph No. 5. The first layer shows no glands in the stroma; the lighter intermediate area, the muscle tissue of the tumor, invading the ovarian cortex irregularly in the right third of the picture.

could be the cause. Always had leucorrhea, which became worse after marriage; for this reason she came to the gynecologist.

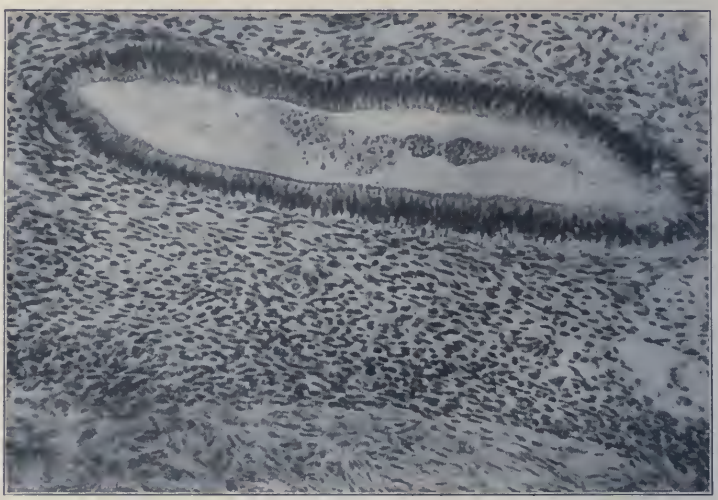
Marital history: Married ten years. Never pregnant. No precautions. General physical examination, negative. Pelvic examination reveals nulliparous inlet. Uterus anteflexed, its body lying horizontally forward; the cervix points downwards and backwards, showing no abnormality. The entire organ is freely movable. Adnexa, negative; no pelvic masses to be felt except a small, nodular, and exceedingly firm body, the size of a hazelnut, behind the cervix between the posterior vaginal wall and the rectum just below Douglas' culdesac. Rectal examination proves the nodule to be in front of the rectum, but not attached to its wall.

Operation, April 12, 1919. Patient was curetted and moderate amounts of scrapings removed. Uterus is normal in size and posi-

tion. Right ovary three, by two and one-half, by two cm. Left ovary of normal size, containing a corpus luteum. Appendix normal; removed. The nodule felt between the vagina and the rectum, as described above, could not be made out from above during the abdominal operation.

April 29, 1919. Vaginal examination: The small tender mass, previously detected, still present. Diagnosis: Tumor of the recto-vaginal septum. Removal of tumor, through vaginal incision, suggested.

May 5th, 1919. A small firm nodular tumor, about the size of a hazelnut, was removed through the vagina by making an



PHOTOMICROGRAPH No. 7.—Adenomyoma of Ovary: High power of a typical gland. Gland contains a group of red blood cells and a few leucocytes; surrounding the gland is the typical endometrium stroma. In the lower portion of the picture the muscle tissue can be definitely seen.

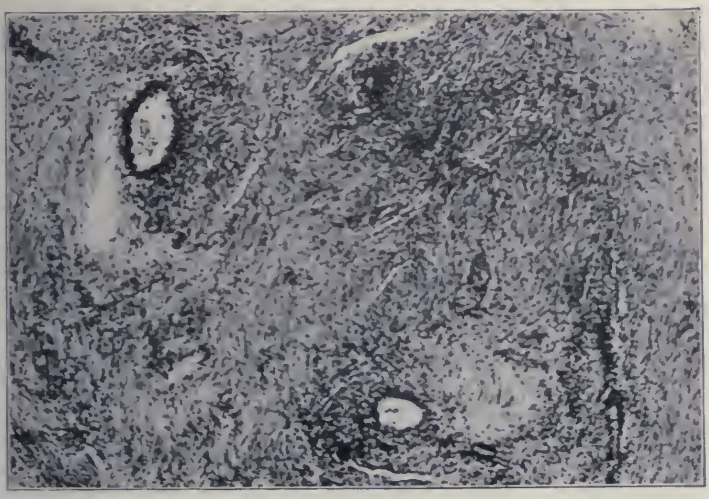
incision directly over it. Microscopic examination of specimen shows it to be hard, ovid mass with slightly irregular surface, surrounded by the loose connective tissue of the rectovaginal space. The growth measures one, by one-half, by one-half cm. On section, its center shows a firm, grayish red tissue with red pin-point spots scattered over its surface. The bisected parts were again divided and prepared for microscopic sections.

Microscopic description: The tissue contained chiefly smooth muscle fibes running compactly, but irregularly, in all directions. Here and there definite bundles are seen; they are particularly noticeable near the periphery where there is a considerable loose areolar tissue. In the compact muscle are found small islands of closely packed cells with deep staining nuclei resembling the stroma of the endometrium. In many of these areas glands are seen, which,

in some places, are broken. These glands are exactly like the glands of the endometrium.

Diagnosis: Typical adenomyoma of the recto-vaginal septum.

CASE II.—*Adenomyoma of the Ovary.*—Patient, A. K. Aged thirty-four. Single. Never pregnant. Has been admitted to gynecological service on three previous occasions. First admission, May 4, 1913. Gynecological No. 241. Chief complaint, pain in the right lower abdomen for the last two years and profuse menses. Menstration began at the age of thirteen. Regular, every twenty-eight days; duration five to six days until the age of seventeen. Was curetted at that time for profuse menstrual flow, and remained free



PHOTOMICROGRAPH NO. 8.—Adenomyoma of recto-vaginal septum: Low power, showing small tubular glands surrounded by an area of connective tissue, rich in nuclei, and embedded in compact smooth muscle tissue with fibers running in all directions.

of symptoms until one year previous to admission. Menstruation irregular for the last year; sometimes as frequent as every two weeks; duration from six to eight days and very profuse.

Pelvic examination: Uterus normal, except for a small nodule at the right cornua. There is a mass in the right adnexal region about the size of a lemon, tender and only slightly movable. Patient was curetted, and the microscopic examination of the scrapings revealed a mild hyperplasia of the glands and of the stroma.

Second admission, May 22nd, 1918. Gynecological No. 1570. Chief complaint: Menstruates for weeks at a time. Flow since first admission normal for one year; after that again irregular and profuse as before. A diagnosis of chronic pulmonary tuberculosis was made two years ago. At present there are no physical signs of this disease.

May 27, 1918. Examination under anesthesia and curettage. Bloody discharge from vagina. Cervix well up in vagina, free from lacerations, short, and points downwards and backwards. Body of the uterus slightly enlarged in first degree retroversion, and freely movable. Left tube and ovary slightly enlarged. Right uterine adnexa, negative. Curetting produced a fairly large amount of scrapings. Microscopic findings. (Gyn. path. No. 777). Mild hyperplasia of uterine glands and stroma. No evidence of tuberculosis.

Second operation. Gilliam-Crossen suspension of uterus, right oophorectomy, myomectomy, and partial resection of left ovary. Uterus slightly retroverted; small intraligamentous subserous myoma near right cornua measuring one and one-half cm. in diameter.

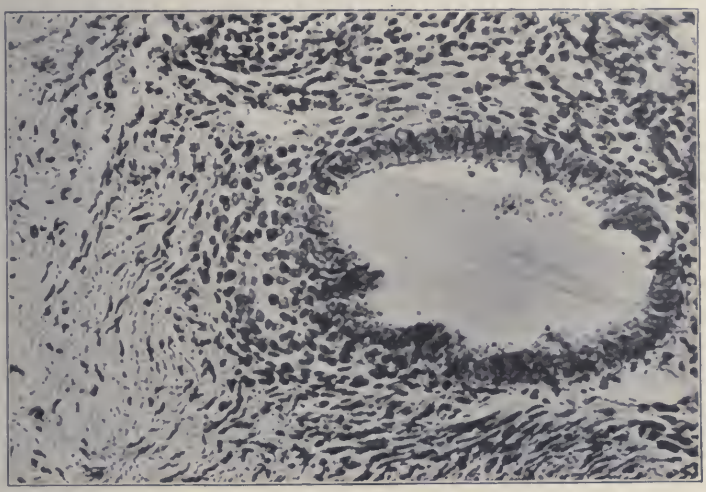
PHOTOMICROGRAPH No. 9.—Adenomyoma of recto-vaginal septum: Low power, similar to photomicrograph No. 8., but showing the muscle fibers to better advantage.

Right ovary, the size of a small lemon, contains several small cysts. Left ovary contains cyst two cm. in diameter at one pole, otherwise it is normal. No evidence of peritoneal tuberculosis. Both Fallopian tubes are normal. Appendix normal, removed.

Gross description of right ovary: Measures five and one-half by four, by two and one-half cm. It is of a yellowish gray color and has markedly wrinkled surface. In spots there are dark bluish discoloration, over which the surface is easily separated. On transverse section there are found several cystic cavities. The cavities are filled with a light-brown, slightly tenacious fluid. Close to the periphery, one of the cavities contains a red, bloody mass. Two large blocks were cut transversely across the ovary, not including the hilus, for microscopic sections. Each block is about two-thirds of a cm. in thickness.

Microscopic description of right ovary: The section measures three

and one-half by 2 cm. its periphery is wrinkled; a dark bluish staining zone, 2 mm. in thickness, surrounds the entire ovary. No hilus, nor large vessels visible. The darker stained tissues represent the cortex; at one end the cortex seems pushed inward by two small cyst cavities each one-half cm. in diameter, and surrounded by a lighter staining area which definitely separates it from this apparent indentation of the cortex. The large cystic cavity one and one-third cm. in diameter, contains no material and is lined by several layers of flattened cells. Another small irregular cavity is lined by granulosa cells, and some lutein cells beneath the deepest layer of the granulosa. The larger of the two smaller cavities, apparently indenting the cortex, is lined by a deep bluish stained tissue imbedded



PHOTOMICROGRAPH No. 10.—Adenomyoma of the recto-vaginal septum: High power, shows a gland similar in structure to those found in the endometrium surrounded by endometrium like stroma. A small amount of muscle tissue is seen at the extreme right.

in which are several glands resembling those found in the endometrium. The stroma in which they are imbedded is also similar to that of the endometrium. The smaller cyst was found at one extreme end of the section. This cyst was filled with distinctly bloody material. The muscle tissue surrounding these glandular cysts resembles uterine musculature; its cells are larger than the cells in the compact ovarian tissue surrounding it. To some extent these atypical muscle cells penetrate the ovarian tissue in an irregular manner.

Third admission, July 7, 1919. Gynecological No. 1919. Present illness: Hemorrhage, at brief intervals, since October, 1918. Loses blood constantly for the last six weeks. Patient was curetted and the scrapings showed a mild glandular and stroma hyperplasia. (Gyn. Path. No. 1226). She is now receiving x-ray treatment.

REFERENCES.

1. Cullen, T. S. *Johns Hopkins Hospital Bulletin*, vol. xxviii. No. 321. Nov. 1917.
2. Cullen, T. S. American Journal of Obstetrics, vol. lxxx. No. 5. Aug. 1919.
3. Heineberg, Alfred. American Journal of Obstetrics, vol. lxxix. No. 4, April 1919.
4. Russel, W. W., *Johns Hopkins Hospital Bulletin*, vol. x. 1899, page 8.
5. Pick, Ludwig, *Berlin Klin. Woch.*, 1905, p. 502.
6. Koch, *Arch. fur. Gyn.*, Bd. 94.
7. Frankl, O., *Liepmen's Handbook*, Bund. ii, p. 229.
8. Lockyer, C., Fibroids and Allied Tumors—McMillan & Co., London, 1918.
9. Rabinovitz, M., American Journal of Obstetrics. vol. lxxvi, No. 1.

PROTECTIVE CHANGES IN THE OVIDUCT.

BY

JAMES E. DAVIS, A. M., M. D.,

Detroit, Michigan.

THE character of the specific function required of the uterine tubes involves a very efficient protection. A somatic function is always secondary to reproduction, and tubal pathology is a preferential process for the preservation of the open lumen and ostia.

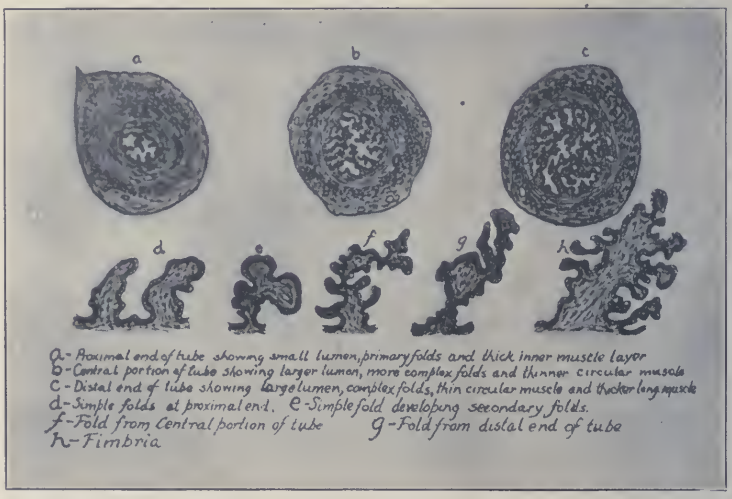
Until puberty the embryonic tubal folds cause an efficient occlusion; after this period the ostia, controlled by specific muscle arrangement and enervated through ovarian and uterine connections or through the sympathetic connections from mucosa to serosa, may open or close, remain open or continue partly or wholly closed, as may best preserve the ultimate function of the organ. Interval constrictions so frequently observed may be imitative of the primary form of protection.

The proximal ostium is designedly only one or two mm. in diameter, with a few simple primary folds which are surrounded by a strong circular and collar-like layer of involuntary muscle bundles. The distal or abdominal ostium is of more complicated architecture because of its higher function.

The many compound folds within the base of the ampullar formation and the long grooved, projected mucosa to peritoneum construction, with its mesothelial stroma and longitudinal muscle retracting, contracting, and relaxing structure provide for at least two forms of closure: one with and one without inclusion of the fimbriæ. A physiological closure doubtless obtains when the reproductive cells are not demanding tubal function; and this closure is obtained by unison contraction of longitudinal and circular muscle fibers. The former, being relatively much more abundant than the latter, consequently are the controlling part of the closure mechanism.

A pathological closure involves additional factors of hypertrophic and hyperplastic tubal wall with a sectional or complete inclusion of its entire structure. An old and thick fibrous peritoneal coat may limit expansion. The mucosal folds may be changed by lateral or

end fusings, by extensive intra- and inter-infiltration processes, or by hypertrophic, hyperplastic, and atrophic stromal changes. An endo- or peri-salpingitis may not specifically designate the anatomical distribution of the morbid changes. The fibrimiæ are retracted rather than inverted within the tubal lumen, for in the same plane and with the same relative base attachments may be seen rugæ and fimbriæ. The delicate mesothelial type of stroma in the fimbriæ indicates the facility with which a diminution in size of this structure may take place.


a
b
c
d
e
f
g
h
a-Proximal end of tube showing small lumen, primary folds and thick inner muscle layer
b-Central portion of tube showing larger lumen, more complex folds and thinner circular muscle
c-Distal end of tube showing large lumen, complex folds, thin circular muscle and thicker long muscle
d-Simple folds at proximal end. e-Simple fold developing secondary folds.
f-Fold from central portion of tube g-Fold from distal end of tube
h-Fimbria

Frontispiece: Composite drawing of oviduct and folds. *a*, *b*, and *c*, cross sections from proximal, middle and distal portions. *d*, *e*, *f*, *g*, and *h*, morphology of folds proximal to distal ends.

The persistency of the lumen and the preservation of the epithelium are quite remarkable in the extensively deformed specimens used in this study. There was but little desquamation, and flattening of cell nuclei occurred only where the surrounding change was very severe. An exception to this condition is seen in the case of bichloride of mercury poisoning, where the only efficient protection possible was accomplished by a uniform destruction of the entire epithelium. The relative larger size and greater number of epithelial cells in the distal portion of the tube provide for a larger fluid production just where it is most needed for protection and propulsion of the germ cells. An excess of secretion, excited by pathogenic organisms, may exert a diluting power and also stimulate muscle contraction closure of ostium and muscle propulsion towards the proximal end of the tube.

The proximal ostium is a short transition from the uterus to the tubal structure. Its efficient long valve, constructed of strong muscle fibers and primary folds, is an interesting contrast to the ostium abdomale. It is a mistake to understand that this ostium is a valve consisting of a few narrow muscle fibers. Trans-sections of the uterine cornu and first portions of the tube prove the extent of this ostium.

The outward, backward, downward, and inward position of the tube as found in the great majority of pathologic processes, if not associated with tubal pregnancy, is signally beneficial for protection. The first essential of tissue repair, rest, is obtained by splinting against the ovary and uterus. The abdominal ostium in this manner becomes intimately adherent to a peritoneal surface. This position facilitates a decreased blood supply and atrophic changes.

Thirty representative cases illustrating twenty-three types are reported and intensively studied to portray the correlation of morphological and histological tubal changes.

Case I.

Microscopic drawing. Chronic streptococcic and gonorrheal salpingitis. Section shows lateral fusing of the oviduct folds, cell débris within the lumen, and tubal epithelium in two places.

Case I.—Chronic Salpingitis, Chronic Peritonitis, Chronic Peri-ovaritis, Streptococcic and Gonococcic Infection Following Abortion and Gonorrhea.

Age of patient, twenty-two years. Married five years; two pregnancies, one normal and one induced abortion. (Venereal case interned by the state).

The gross specimen exhibits a massed tube and ovary. The cross section shows intimate adhesion of ovary and tube. The tubal wall is thickened and is evidently fibrous. The lumen is

2 mm. in diameter. The ovary shows multiple cyst formation, corpora albicans, and young corpora lutea.

Microscopic Examination.—The tube is seen in full cross section at the left and in part at the right, adjoining the largest cyst. The explanation of this formation is that the tube has passed outward, downward, and backward close to the upper surface of the ovary.

The pathological changes are intimate massing of ovary and tube; focal lymphocytic infiltrations through tubal and ovarian stromas; diffuse infiltration of tubal mucosa; muscularis and serosa. The infiltration of the mucosa is very marked. There is only marginal infiltration of ovarian stroma. The ovary shows well preserved Graafian follicles of different sizes; the larger ones showing cystic degeneration. The peritoneal coat of the tube is thickened, edemic, and hyperemic. The muscularis cannot be easily defined as longitudinal and circular layers, and the muscle bundles are quite commonly separated by the edemic and infiltration changes. The plicae are extensively massed with but very few free end portions, giving a general picture which might be mistaken for glands. The basal portion of some of the plicae are narrowed, but the majority show broad bases. The lumen is partially closed by cellular debris consisting mostly of degenerating pus cells.

Case II.—Late Acute Streptococcic and Gonorrheal Salpingitis and Peritonitis. Two Weeks after Abortion, Following a Previous Gonorrheal Salpingitis and Ovaritis of Unknown Periodicity.

Aged twenty years. Unmarried. One full term child is living, and has had one incomplete abortion with sapremic infection. Wassermann Reaction was positive (xxxx).

The gross specimen exhibits a massed tube and ovary, a cross section of which shows a completely fibrosed tube and an almost complete cystic degeneration of the ovarian structures. The contents of the cysts show gelatinization.

Microscopic Examination.—The ovary and tube are intimately massed. The ovarian histology shows the function of the ovary is still preserved, as evidenced by the Graafian follicles. The tubal wall as compared with Case 1 shows extensive peritoneal involvement with thick organizing purulent exudate on the surface. The muscularis shows less individual separation of muscle bundles, but relatively more pus cell infiltration. The plicae are densely infiltrated with pus cells, and the inter-spaces are entirely filled with organizing pus. The lumen is obliterated, with the exception of a small area in the central part of the trans-section.

Case III.—Right Gonorrheal Pyosalpingitis with Extensive Fibrosis and Multiple Medium-sized Cyst Formations.

Aged forty-six years. Chief symptom, dull pain in iliac region.

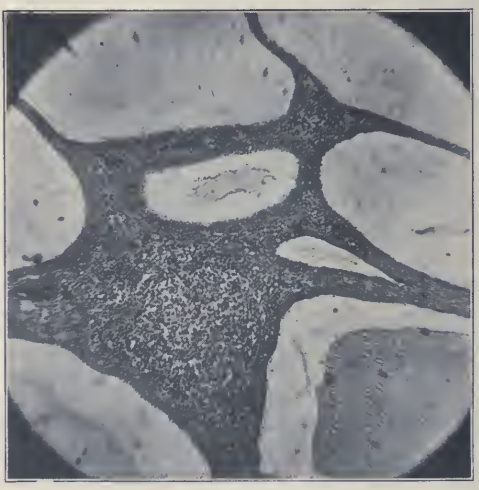
The gross specimen exhibits a very irregular outline with numerous nodulations, as well as numerous cysts, upon the peripheral surface. The length is 9 cm., and the diameter is 4 cm. The longitudinal section shows two strictures near the center, each stricture being 1 cm. thick. The distal portion of the tube still retains a patent lumen which is 1.5 cm. in diameter.

CASE II.

Upper.—Drawing of gross specimen.
Middle.—Photomicrograph of wall.
Lower.—Photomicrograph of mucosa.

Microscopic Examination.—*Section* (*a*) shows inverted tubal fimbriæ.

Section (*b*) is taken from the distal end beyond the area of inverted fimbriæ.



CASE III.

Upper.—Drawing of gross specimen.

Lower.—Photomicrograph of section taken at "a" in the drawing, showing changes in the mucosal folds.

Section (*c*) is taken from the proximal end of the tube.

A comparison of the three sections shows the characteristic picture of the relative changes in the histology of the tubal elements. In Section (*a*) the longitudinal muscle fibers can be identified, though they have undergone marked hyaline changes. The cir-

cular layer cannot be identified. The fimbriæ show a distinct massing, but the units are very much longer and narrower than are those of plicæ developed within the tube. There is small round celled infiltraton of the stroma of the fimbriæ, and also some focal aggregations of the same type of cells. In portions of the tubal wall there is dense diffuse infiltration of small round cells of various types, polymorphonuclears, plasma cells, and lymphocytes.

In Section (*b*) the plicæ are low and thick, dome-shaped, densely massed, and show marked increase of fibrous tissue, in places disposed in whorl-like formation. The muscularis is of greater thickness and shows extensive replacement by connective tissue.

In Section (*c*) the plicæ are larger but fewer in number, and show diffuse infiltration of small round cells with a greater proportion of lymphocytes than in the other sections. The muscularis shows heavier muscle bundles and a greater relative thickness and relatively less degeneration. There is extensive exfoliation of epithelium.

Case IV.—Mild Non-specific Inflammatory Changes in Fallopian Tubes and Ovaries, with Fibroid Tumors of the Uterus.

Aged forty-eight years. Chief symptoms, hemorrhages and pain.

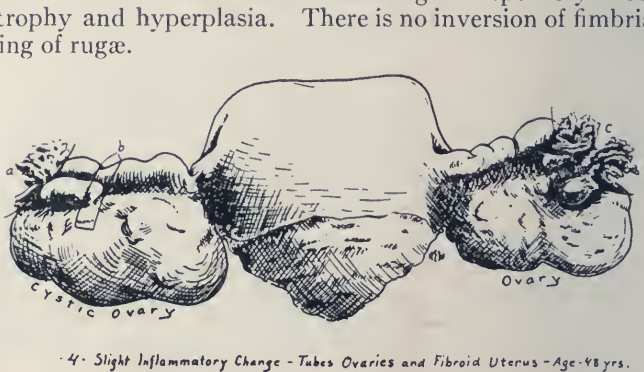
The gross specimen consists of uterus, Fallopian tubes, and ovaries. The uterus, which is markedly fibrous, is somewhat larger than a large orange. One of the ovaries is markedly cystic and has disposed upon its surface considerable fibrous tissue. The Fallopian tube adjoining this ovary shows interval constrictions, connective tissue increase, and slight hypertrophy of fimbriæ. The other ovary is smaller and the tube is intimately attached to the hilum, the distal end of the tube being connected by a definite, continuous fibrous union with the ovary. The fimbriated portion is divided into two parts by a fibrous sealing of the ostium. The fimbriæ are hypertrophic and hyperplastic, and there are two cysts developed in common with the fimbriæ, one of which is 1 cm. by .5 cm.

Microscopic Examination.—Section (*a*).—The serosa exhibits inflammatory changes of moderate degree, characterized by some lymph exudation and some mononuclear infiltration. The muscularis consists of relatively few muscle bundles, and is markedly cavernous from blood and lymph vessels. The submucosa is narrow and is impinged upon by the cavernous tissue. The blood-vessel walls are generally thickened, and the lymph vessels are dilated. The mucosa exhibits rugæ that are not greatly changed, except for an increase of stroma and cavernous changes therein. There is no fusing of rugæ, and there is no inversion of fimbriæ. The essential change is one of passive congestion, with consequent moderate connective tissue increase. Through one plane there is a slight peri-salpingitis.

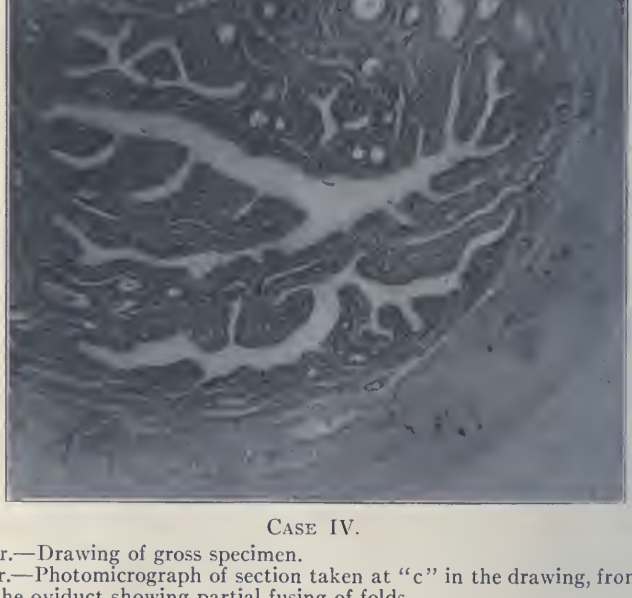
Section (*b*).—The tissue consists entirely of ovarian stroma, except a narrow strip of muscle tissue. The structure shows compression changes and early atrophy, and also slight diffuse mononuclear infiltration. The general form is such as to indicate that this tissue in part forms the wall of a cyst.

Section (*c*).—The serosa shows slight inflammatory change.

This is seen also in the longitudinal muscle layer which can be divided into two parts. The circular muscle layer can be identified. The entire wall is markedly vascular and shows slight mononuclear infiltration. The mucosa shows no change except very moderate hypertrophy and hyperplasia. There is no inversion of fimbriæ and no fusing of rugæ.



4. Slight Inflammatory Change - Tubes Ovaries and Fibroid Uterus - Age 48 yrs.



CASE IV.

Upper.—Drawing of gross specimen.

Lower.—Photomicrograph of section taken at "c" in the drawing, from distal end of the oviduct showing partial fusing of folds.

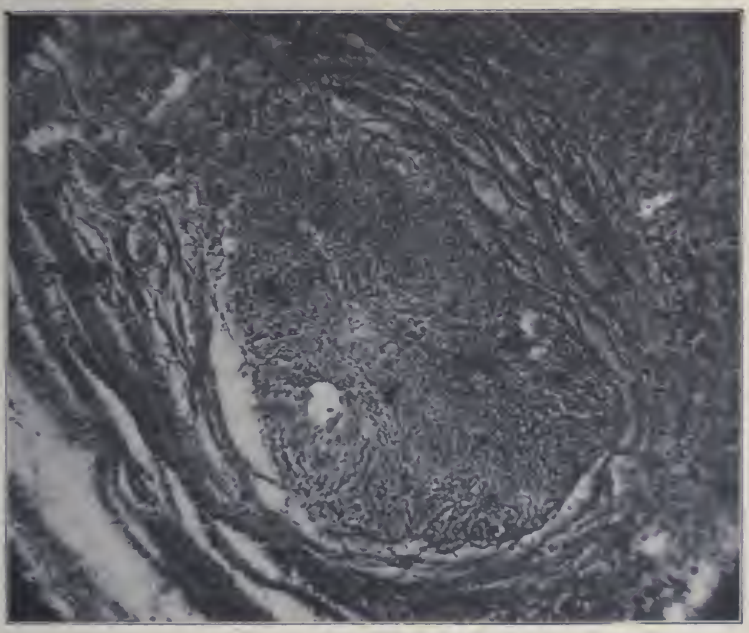
CASE V.—Bilateral Tubercular Salpingitis. Case of Dr. Hayd's Buffalo, New York.

Aged twenty-six years. Chief symptom, backache. Patient otherwise in good health. (Full description of the case is given by Dr. Hayd on page 53 of the Transactions of the Association for 1918).

The gross specimen consists of the right and left Fallopian tubes. The smaller tube is 14 cm. long by 5 cm. in cross diameter, and it

is enlarged so as to make a hunter's horn formation. The diameter of the proximal end is 2 cm., and the wall averages 1.5 mm. in thickness.

5 Tubercular Infection Oviducts Age 26 yrs.



CASE V.

Upper.—Drawing of gross specimen.
Lower.—Photomicrograph of section taken at "a" in the drawing, showing old tubercle formation.

The larger tube is an inverted pipe formation. The stem portion is 9 cm. long, the proximal diameter is 1.3 cm., and the distal diam-

eter is 3.5 cm. The bowl portion is 13 cm. in its longer diameter and 9 cm. in its shorter diameter. The wall averages 1.5 mm. in thickness. The bowl formation is filled solidly with pseudo-mucin.

Microscopic Examination.—*Section* (*a*).—The serosa and muscularis show marked inflammatory changes from tubercular infection. The classical picture of tubercles of various ages accompanied by giant cells and followed by local fibrous change as a tracery of the healed tubercles and the diffuse mononuclear infiltration, make very complete evidence of this process. The condition is older in Section (*a*) than that seen in the sections from other positions, there being more fibrosis and few giant cells. The tubercles are mostly old and healed. This, however, applies more strictly to the serosa and muscularis. The process as seen in the mucosa is more recent.

Section (*b*)—offers an interesting contrast to *section* (*a*)—in that only local aggregations of leucocytes are seen in the muscularis and serosa. Upon the mucosal side there is a deposition of caseated material. In the submucosa there is a marked diffuse mononuclear infiltration with some very young tubercles.

Section (*c*)—exhibits a thinner tubal wall than that of (*a*) or (*b*), and the structures show marked pressure changes of atrophy and distension. There is also marked hyaline degeneration in portions of the wall. The submucosa has been almost entirely obliterated. The mucosa shows a contrast with sections (*a*) and (*b*) by lateral fusing of the rugæ and also end-to-end fusing. Within the spaces bounded by epithelium there is much exudative material. This has undergone organization and in very many places is invaded by tubercle formations. The stroma in many places is hypertrophic and hyper-plastic and contains multiple young tubercles. For the most part the epithelium is well preserved.

Section (*d*).—The typical architecture of the tubal wall isthmus is seen. The wall shows both focal and diffuse mononuclear cell infiltration, and an occasional young tubercle. The mucosa shows extensive fusing of rugæ, forming a solid mass in the greater part of the lumen. In this tissue there are found caseated material and an occasional young tubercle.

Case VI.—Bilateral Late Sub-Acute Endo- and Peri-Salpingitis with Pyo- and Cystic Ovaritis, Mixed Infection.

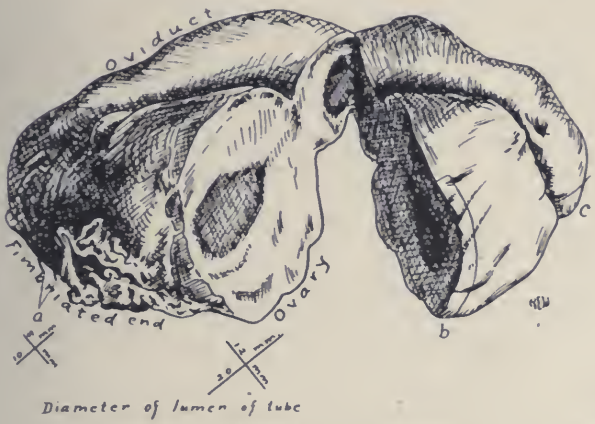
Aged forty years. Duration of condition, 2 yrs. Chief symptom, pain in lower abdomen.

The gross specimen shows a massed Fallopian tube and ovary with entire obliteration of parovarian tissue. The tube partially surrounds the upper surface of the ovary.

Microscopic Examination.—*Section* (*a*).—The tubal wall is greatly thickened and is diffusely infiltrated with mononuclear and polynuclear cells the former being more numerous. Many of the polynuclears are plasma cells. The mucosa exhibits a lateral and end-to-end fusing of rugæ, also hypertrophy and hyperplasia, which is most marked in the stromal portions. The rugæ are partially fimbriated end types; these, however, are few in number. The lumen is not obliterated and contains a large quantity of debris, which consists largely of pus cells.

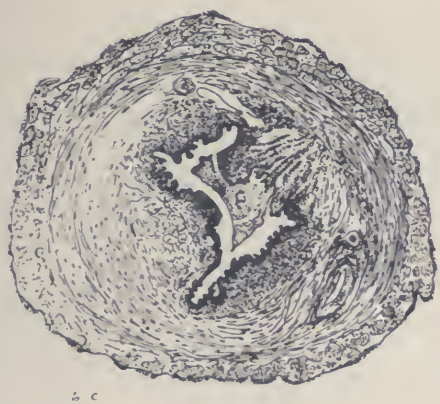
Section (*b*).—This section shows essentially the same changes as observed in Section (*a*), except that ovarian and parovarian tissue is involved.

Section (*c*).—This section retains the essential histological architecture of the proximal end of the tube. The mucosal folds are



6 Late Sub-acute Endo-and Peri-Pyosalpingitis and Ovaritis

Mixed Infection Two Years Duration Age 40 yrs



CASE VI.

Upper.—Drawing of gross specimen.

Lower.—Microscopic drawing of section taken at "c," showing relatively thick circular coat, relatively thin longitudinal coat, folds partly obliterated.

few in number, and the epithelium is atrophic and has undergone some hyaline change. The lumen is occupied by organizing cellular debris in which are large numbers of pus cells. This condition illustrates changes following mixed infection, gonorrheal and strep-

tococcic in type, and the entire adnexa is involved in a chronic inflammatory process.

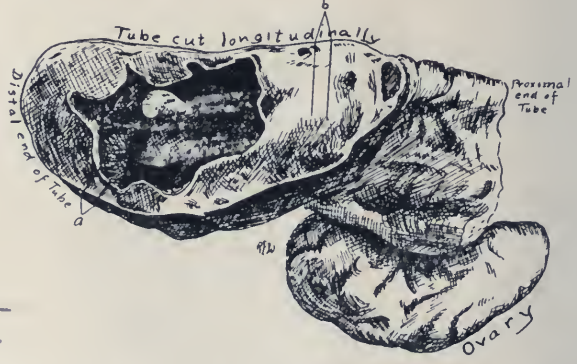
Case VII.—Early Chronic Endo- and Perisalpingitis. Mixed infection of three years' duration.

Age thirty-three years. Chief symptoms was pain in the pelvic region.

The gross examination shows a specimen of an enlarged Fallopian tube with irregular lumen which is partially filled with coagulated pus. The wall shows a distinctly marked fibrous tissue increase. This tissue is disposed more or less in an irregular way in places appearing as bands, and is intimately associated with organizing purulent material. The fimbriæ are completely massed and partially inverted, and the edges are but slightly frayed.

Microscopic Examination.—This specimen exhibits the same type of inflammatory change as is seen in Case 6, but the inflammatory process is of longer duration. The history shows a change extending over a period of three years, while Case 6 covers a period of two years' duration. The histologic changes are essentially the same in both cases, except that in No. 7 the deformity is greater from the extensive connective tissue increase. Not only is this seen in the muscularis, but it also occurs extensively in the mucosa. In Section (*c*) the serosa is markedly thickened and has undergone fibrous and hyaline changes, indicating a severe chronic peritonitis. The infiltration process is widely diffused, and the infiltrated cells are of mixed type, pus cells largely predominating upon the mucosal surface.

Case VIII.—Tubal Pregnancy and Chronic Salpingitis. Embryo in Distal End of Tube.



8 Tubal Pregnancy and Chronic Salpingitis Age 29 yrs

Case VIII.
Drawing of gross specimen.

Age twenty-nine years. Chief symptoms, abdominal pain.

The gross specimen consists of an ovary and Fallopian tube. The distal end of the tube contains a small fetus, 12 mm. The proximal end of the tube is fibrous and markedly thickened to the extent of 2 cm. because of old inflammatory changes. The portion of the wall of the tube containing the fetus varies in thickness from 1 mm.

to between 1.5 cm. and 2 cm., the thicker diameters being at the distal and proximal ends of the dilated portion.

Microscopic Examination.—The sections from this case illustrate a tubal pregnancy showing unmistakable evidences of chronic perisalpingitis. At different places in the muscularis there are aggregations of mononuclear cells, chiefly lymphocytic in type. The muscle bundles show atrophy and hyaline change. Upon the mucosal side of the tubal wall there are remnants of rugæ and a laminated blood clot with enmeshed chorionic villi and amnion.

Case IX.—Unilateral Pyosalpingitis, Marked Fibrous Thickening of Wall. with Areas of Hemorrhage. A Probable Unruptured Tubal Pregnancy.

Aged twenty-four years. Chief symptoms, pain and abdominal distension.

The gross specimen exhibits a Fallopian tube showing marked fibrous change in the proximal portion and a cystic enlargement of the distal end. The size of the cyst is 6 cm. in the longer diameter and 5 cm. in the shorter diameter. The shape is oval, and the wall varies in thickness from 3 to 10 mm.

Microscopic Examination.—There is a peculiar pod-like formation of the distal portion of the tube with purulent exudate upon the inner wall, and numerous areas in the walls showing old hemorrhage.

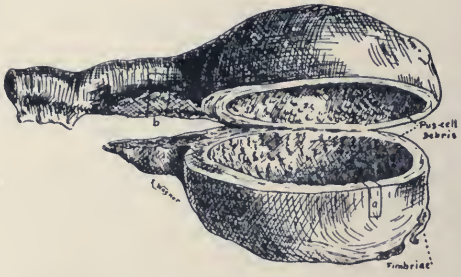
Section (*a*).—Exhibits a diffuse small round cell infiltration disposed somewhat in narrow zones through the muscularis. There are also areas of red blood cell extravasation disposed in the same manner. The submucosa is densely infiltrated with pus cells and contains zones of marked connective tissue increase. In these zones of connective tissue there are localized aggregations of blood pigment.

Section (*b*).—Shows a thickened and infiltrated serosa which is moderately hyperemic. The muscularis shows three distinct layers. In each there is a marked connective tissue increase and focal infiltration. The submucosa contains a large number of eosinophiles. The mucosa shows deformity, hypertrophy, and hyperplasia of the rugæ, and also a moderate diffuse and focal small round cell infiltration in the stroma of the rugæ. There is some lateral fusing of the rugæ.

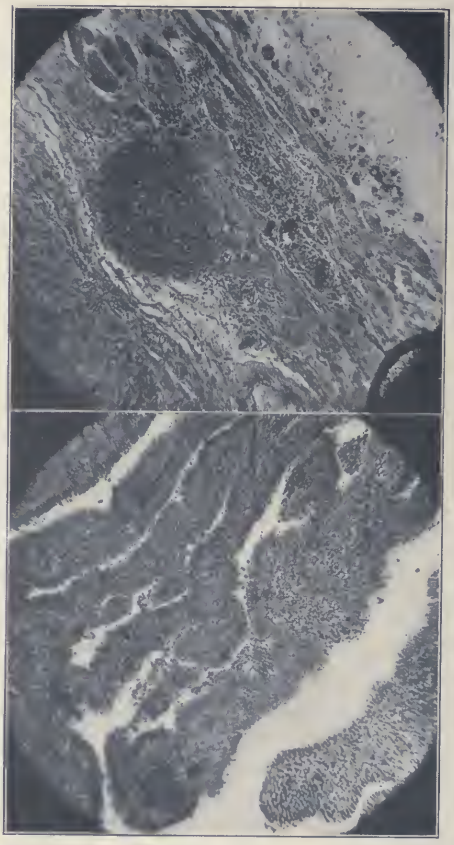
Case X.—Chronic Salpingitis with Calcification and Tubal Pregnancy and Ovarian Cyst.

The gross specimen consists of a tubal pregnancy and multiple cystic degeneration of the ovary. The Fallopian tube is distended to a diameter of 6 cm. by an organized blood clot. The tubal wall is 5 mm. to 1 mm. in thickness. The cyst wall contiguous to the tube is intact, and the cyst lying between the tube and the ovary is 5 cm. in diameter. The second cyst, within the ovary, is 17 mm. in diameter and the distended rim of the ovary is 1 cm. in thickness. The ovary is disposed so as to lie directly below the two cysts, which are directly below the tube. The fimbriated end of the tube shows an almost complete retraction within the lumen of the tube.

Microscopic Examination.—Section (*a*) illustrates a flattened



9. Chronic Pyosalpingitis and Old Hemorrhage. - Age - 24 yrs.



CASE IX.

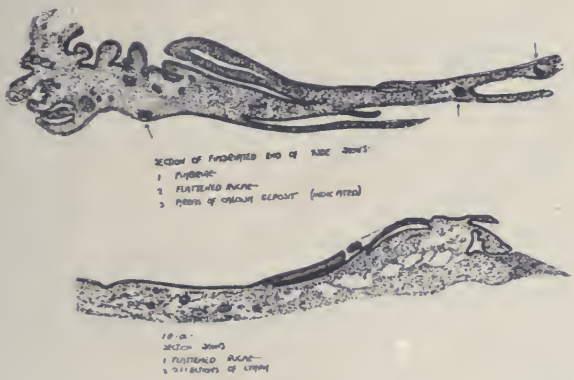
Upper.—Drawing of gross specimen.

Middle.—Photomicrograph of section taken at "b" in the drawing, showing wall and large focal infection.

Lower.—Photomicrograph of section taken at "b" showing hypertrophic and hyperplastic plicæ.

condition of the rugæ which are lying in the long diameter parallel with the tubal wall. A few partially inverted fimbriæ are observed. These are typically elongated and contain calcium deposits and considerable blood pigment. The stroma is infiltrated with plasma cells and lymphocytes.

10 - Chronic Salpingitis with Calcification and Pregnancy, and Cystic Ovary



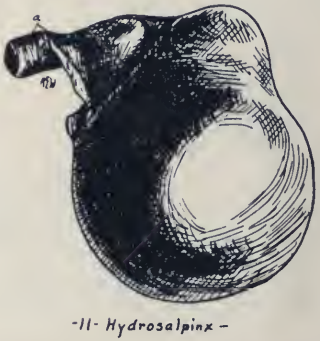
Case X.

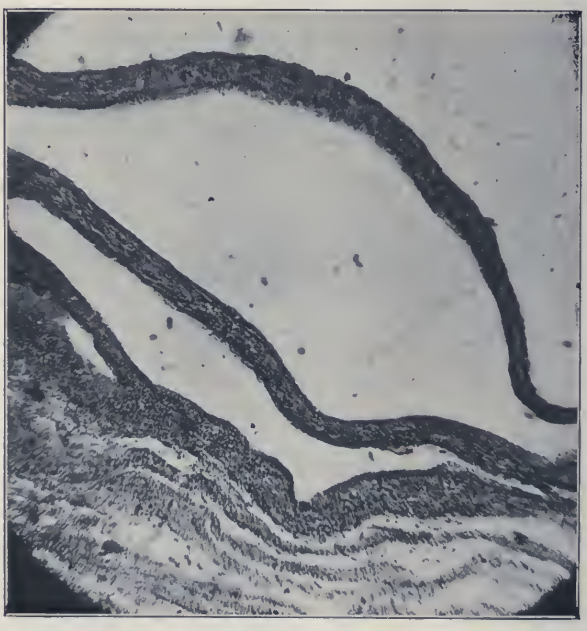
Upper.—Drawing of gross specimen.
Lower.—Microscopic drawing of section taken at "a," showing flattened rugæ, fimbriæ and areas of calcium deposits.

Case XI. Hydrosalpinx, Showing Rugæ in the Process of Obliteration.

The gross specimen is that of a rather small tube, with fibrous wall at the proximal end. The distal end is enlarged by cystic degeneration so as to make a modified pipe form. The wall of the tube has been dilated so as to be very thin.

Microscopic Examination.—Case XI is one of hydrosalpinx, in which there is the characteristic deformity in the gross specimen. *Section* (*a*) exhibits a characteristic dilation of tubal walls and consequent enlargement of the lumen, and a typical flattening of rugæ into a parallel position with the long axis of the wall.





CASE XI.

Upper.—Drawing of gross specimen.
Lower.—Photomicrograph of section taken at "a" in the drawing.

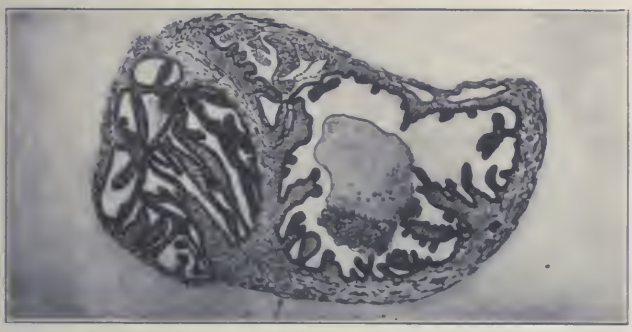
The folds show marked narrowing and apparent elongation with both lateral and end-to-end fusings, giving an ornamental fence picture. The changes in the wall are chiefly from distension, producing a pressure atrophy and a hyaline degeneration.

Case XII.—Receding Chronic Gonorrheal Endo-Salpingitis, with Complete Protection of Peritoneum by the Abdominal Ostium.

Aged twenty-four years. Duration of condition, 5 years. Chief symptoms, recurrent and severe pain in pelvis and abdomen.

The gross specimen consists of a Fallopian tube with clubbed distal end. The fimbriæ have been completely inverted, and on longitudinal section no trace of the fimbriated portion is seen. The cross section shows a lumen almost obliterated. A large part of the diameter of the tube is occupied by organizing pus.

Microscopic Examination.—Case 12 is a typical gonorrheal salpingitis with complete protective closure of the external ostium, with fimbriæ entirely inverted. The resistance offered against leakage of tubal contents is shown adequately by the knob-like enlargement and complete smooth surface sealing of the ostium.



Case XII.

Microscopic drawing. Showing long folds or fimbriæ at the right, and short deformed plicæ at the left. Pus cell and plasma cell dèbris is seen in the lumen.

Section (*a*) shows focal infiltrations of mononuclear cells in the tubal wall and thickening by connective tissue hyperplasia. The mucosa shows two types of rugæ, one unusually long and typical of the fimbriated portion, and the other shorter and typical of the enclosed mucosa. The folds are markedly hypertrophied, and are densely infiltrated with mononuclear cells. Within the open spaces of the lumen there is considerable cellular debris.

Section (*b*) differs from Section (*a*) in that there is a more diffuse infiltration of the muscularis by polymorphonuclear cells, many of which are eosinophiles. The rugæ are in marked contrast with the forms that prevail in hydrosalpinx. Here they are rather short and broad, particularly across the distal end portions. The lateral fusing is extensive.

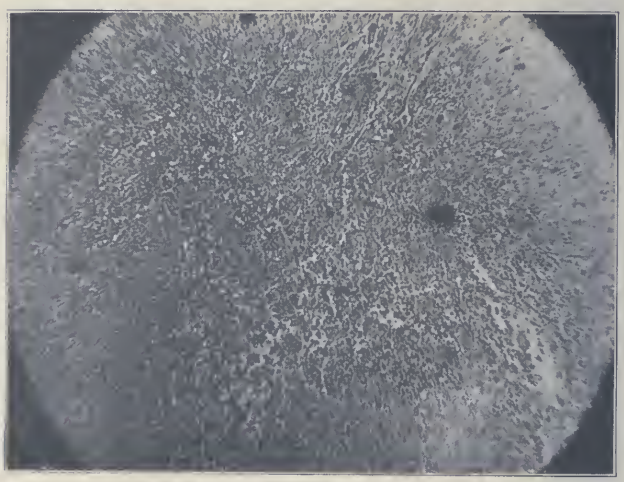
Case XIII.—Tubal Pregnancy with Chronic Infection and Infected Corpus Luteum.

Aged twenty-nine years.

The gross specimen includes an ovary and Fallopian tube. The ovary exhibits an extruded corpus luteum, 2 by 2.5 cm. in size, with a wall averaging 3.5 mm. in thickness. The cavity is 12 mm.

by 18 mm. and represents a typical cyst. The Fallopian tube exhibits a ruptured wall with organized blood clot in situ, the rupture having taken place proximal to the mid-point of the tube. Distal to the mid-point a small cyst is seen upon the under side, and the fimbriæ are seen to be closely drawn against the ostium. On section a small fetus was observed within the lumen.

13 Tubal Pregnancy with Chronic Infection and Infected Corpus Luteum
Age - 29 yrs



CASE XIII.

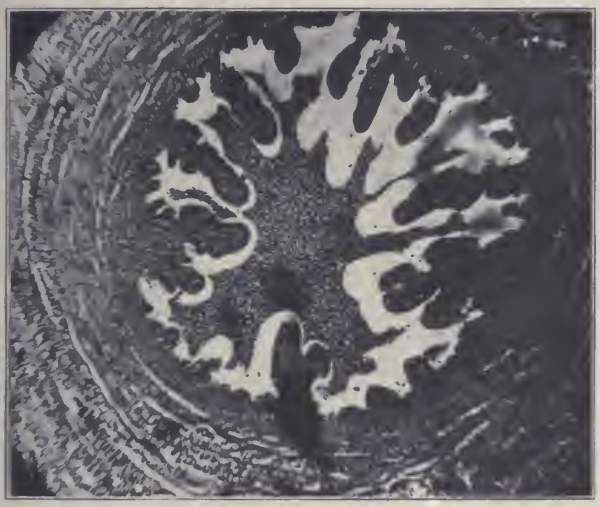
Upper.—Drawing of gross specimen.
Lower.—Photomicrograph of the dense pus cell infiltration of the corpus luteum shown at "a" in the drawing.

Microscopic Examination.—Section (*a*) shows a typical corpus luteum of pregnancy with an extensive infection. The infection is in multiple foci, eight being counted in this section. In each there are typical pus cell debris and hemolyzed red blood cells.

Section (*b*) shows a wall with extensive connective tissue hyperplasia. The mucosa exhibits two types of folds, one long and nar-

row, typical of the fimbriæ, and the other type of branched folds found in the distal part of the tube. The tubal wall is greatly distended, and the fimbriæ are flattened against the inner surface of the wall by the pressure from an organizing blood clot within the lumen. The blood clot, mucosa, and submucosa are infiltrated with pus cells.

14- Chronic Bilateral Endo- and Peri Salpingitis.
Mixed Infection Older Process in Right Tube.
Five Years Duration Age 23 yrs.



CASE XIV.

Upper.—Drawing of gross specimen.

Lower.—Photomicrograph of section taken at "f" in the drawing, showing receding infection.

CASE XIV.—Chronic Bilateral Endo- and Peri-Salpingitis of Five Years' Duration. Mixed Infection. Right Tube Infection Receding.

Aged twenty-three years. Duration of condition, five years. Chief symptom, pain in abdomen and in lower left iliac region.

The gross specimen exhibits both Fallopian tubes, one of which

shows marked thickening of the distal two-thirds which is enlarged to a diameter of 15 mm. The fimbriæ have been completely inverted, and the proximal end of the tube is small and distinctly fibrous. The second tube shows relatively less enlargement, but is closely massed with the ovary, the distal end of the tube curving intimately about the ovary.

Microscopic Examination.—*Sections* (*a*) and (*b*) exhibit a greatly thickened wall and marked connective tissue increase. Relatively little muscular tissue is preserved. The wall has been extensively infiltrated, both focally and diffusely, with small round cells, the mononuclear type prevailing. The mucosal folds are much enlarged and extensively fused and extensively infiltrated with mixed cell types. A small number of inverted fimbriæ are observed.

Section (*c*) shows a markedly thickened peritoneal layer, and the longitudinal portion of the muscularis is more than half replaced by connective tissue. Through the entire muscularis there are numerous focal infections of mononuclear cells. The mucosal folds are twelve in number and are hypertrophic and hyperplastic. There is no fusing of the folds.

Section (*d*) shows the same essential changes observed in the fimbriated end of the left tube, except that there is a greater connective tissue increase, both in the wall and in the plicæ.

Section (*e*) shows more extensive fusing of rugæ and longitudinal flattening of areas surrounded by epithelium and adjoining the submucosa, this being indicative of long continued pressure in an outward direction.

Section (*f*) shows relatively much less change of muscle tissue, there being a relatively small amount of connective tissue in the walls. The infection is much less extensive. The lumen is larger and the folds are sixteen in number, these being longer than those in *section* (*c*) of the right tube, which corresponds to the greater distance of this section from the ostium.

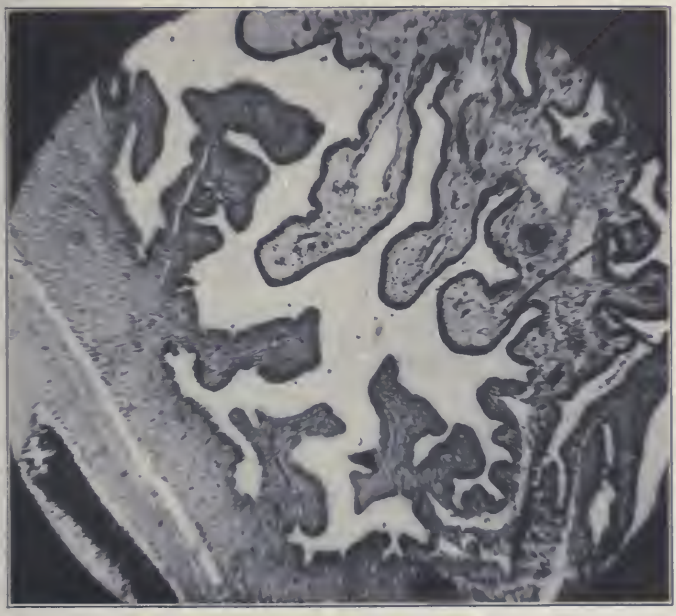
Case XV.—Chronic Healed Gonorrheal Salpingitis with Partially Inverted Fimbriæ and Cyst Formation with Corpus Luteum Involved in the Immediate Portion of the Cyst Wall and the Oviduct in the Remote Portion of the Cyst Wall.

Aged forty-two years. Duration of condition, one year. Chief symptom, abdominal pain.

The gross specimen shows a Fallopian tube and ovary, most intimately massed. The tubal wall has become part of the wall of a cyst which includes also in its wall, portions of the ovary. Right-angle stricture bands are seen in the specimen, one of these being particularly prominent. The fimbriæ of the tube show bipartate massing with the ostium firmly closed, leaving considerable of the fimbriated tissue extruding.

Microscopic Examination.—Section (*a*).—The tubal wall shows an occasional focal mononuclear infiltration. The blood vessels show some dilatation. The mucosa includes both fimbriæ and distal end rugæ. The epithelium is well preserved and the folds show moderate hypertrophy and hyperplasia and slight monounclear infiltration.

-15- Healed Chronic Gonorrheal Salpingitis and Cystic Degeneration of Ovary. Age - 42 yrs.



CASE XV.

Upper.—Drawing of gross specimen.

Lower.—Photomicrograph of section taken from distal end of oviduct at "a" in the drawing, showing both plicæ and fimbriæ.

Section (*b*) consists entirely of connective tissue, well supplied with blood vessels. On one side there are typical corpus luteum cells. There is no active change taking place in the tissue.

Section (*c*) is typical parovarian tissue showing no change other than moderate hypertrophy and dilatation of blood vessels, with an edging of corpus luteum.

Case XVI.—Chronic Gonorrheal Salpingitis and Ovaritis.

The gross examination shows two specimens from the same case In each specimen there is intimate massing of the tube and ovary. In neither specimen can the fimbriated portion of the tube be identified. In each specimen the distal end of the tube has curved about the ovary. Both tubes and ovaries show pyogenic changes and marked cystic degeneration. The deformity shown is typical of this condition.

Microscopic Examination.—Section (*a*) shows a thin wall of deformed ovarian tissue within which is a large mass of cellular debris, consisting largely of degenerating pus cells.

Section (*b*) shows the peritoneal coat greatly thickened and infiltrated with small round cells of mixed types. The muscularis shows marked hyaline changes, extensive loss of muscle nuclei,and infiltration with small round cells. The mucosa exhibits many dome shaped folds, which show lateral and end-to-end fusing. The lumen contains a large amount of pus cell debris.

Section (*c*).—The serosa is very compact and markedly hyaline. The muscularis is thick and shows some connective tissue hyperplasia and focal infiltration of areas by small round cells. The mucosa has sixteen folds, roughly resembling clover leaves. The stroma is infiltrated with small round cells, and the lumen contains pus cell debris.

Section (*d*).—This section contains both tubal and ovarian structures. In the ovarian tissue there is a large corpus luteum. The tubal wall shows considerable connective tissue increase and the mucosal folds are few in number, and are either flattened and atrophic or broad and irregularly dome-shaped.

Section (*e*).—This section shows the same essential changes, except that there is considerable fatty infiltration in the tubal wall, the mucosal folds are much longer, and the hyperplastic change in the stroma is more marked.

Case XVII.—Double Hydrosalpinx of Moderate Enlargement with Completely Sealed Ostia, and a Well-Advanced Carcinoma of the Cervix Uteri.

Aged thirty-nine.

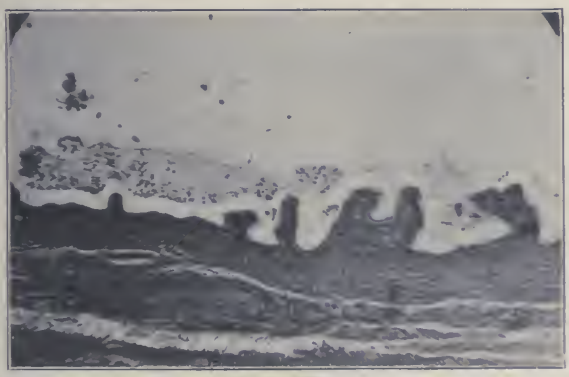
The gross specimen consists of the uterus, with Fallopian tubes and ovaries. Both tubes exhibit closed fimbriated ends, with no trace of fimbriæ. One tube is intimately massed with the ovary and both tubes show the same type of cystic change. The cervix uteri shows a typical carcinomatous degeneration.

Microscopic Examination.—Section (*a*) illustrates a typical tubal wall in hydrosalpinx, with marked evidence of distension, the blood vessel walls being elongated and the muscle bundles narrowed,

many nuclei being either destroyed or are very small and compressed. The mucosa shows destruction of rugæ, or rugæ much diminished in height and general dimensions.

Section (*b*) shows extensive infiltration with epithelial cell, new growth tissue of squamous type in medullary formation, giving a typical picture of medullary squamous-celled carcinoma.

17 Bilateral Hydrosalpinx with Carcinoma of Cervix Age 39 yrs



CASE XVII.

Upper.—Drawing of gross specimen.
Lower.—Photomicrograph of section taken at "a" in the drawing, showing destruction of folds and cystic changes in the tube.

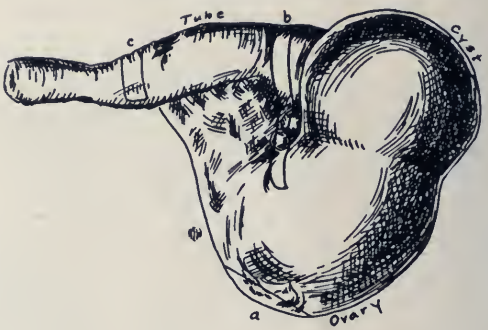
CASE XVIII.—Infected Tubo-Ovarian Cyst, and Early Chronic Endo-and Peri-Salpingitis.

Aged seventeen years. Unmarried. Never pregnant. Interned for venereal disease by the State. Exposure to venereal infection began fifteen months prior to operation.

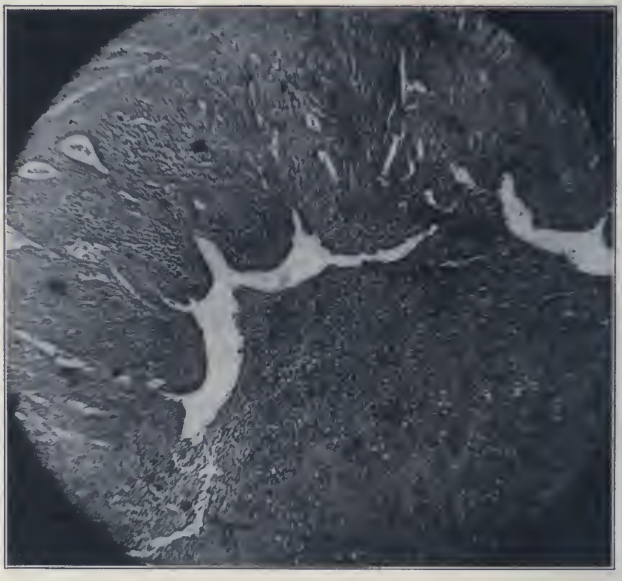
The gross specimen consists of a Fallopian tube exhibiting fibrous thickening of its proximal end, with gradual enlargement toward the distal end. The tube has been occluded by inflammatory change, with cyst formation and massing of the ovary. The midportion

of the tubal wall shows a thickening of 4 mm., and the lumen is filled with organizing pus.

Microscopic Examination.—*Section* (*a*) consists entirely of ovarian tissues in which are Graafian follicles undergoing cystic degeneration. There is also one small hematoma.



-18- Infected Tubo-Ovarian Cyst and Early Chronic Endo-and Peri-Salpingitis. 15 months Duration. Age 17yrs.



CASE XVIII.

Upper.—Drawing of gross specimen.

Lower.—Photomicrograph of cross section taken at "c," showing marked lateral fusing of folds.

Section (*b*) shows both ovarian and tubal structures. The part of the cyst wall shown in the section is constructed of ovarian tissue. The tubal wall is diffusely infiltrated with small round cells of mixed

types. The mucosa shows long, hypertrophic, hyperplastic folds with frequent narrow pedicled bases. The stroma is densely infiltrated with small round cells. The lumen contains a large mass of pus-cell debris. The cellular infiltration process extends into the ovarian tissue.

Section (*c*) shows a much thickened wall with marked increase of fibrous tissue. There is a diffuse small round cell infiltration in the circular muscle layer, and a focal infiltration of the same type of cells in the longitudinal muscle layer. The mucosa shows extensive lateral fusing of the folds. The stroma of the folds is markedly edemic and infiltrated with pus cells. The epithelium shows extensive desquamation.

Case XIX.—Acute Double Gonorrheal Salpingitis, Ovaritis of Left Ovary with Left Tube Almost Completely Surrounding the Ovary, and Extensive Pyogenic Exudate in the Pelvic Cavity.

Aged thirty-eight years. Married. Has had five children and one miscarriage. Chief symptoms, pain in lower lumbar region and pelvis, yellow vaginal discharge which began five years previous. Smears were positive to gonococci.

Case XIX.
Drawing of gross specimen.

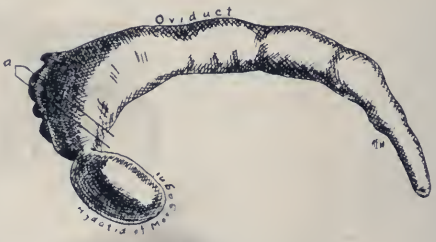
The gross specimen consists of both tubes and ovaries from a case of chronic gonorrheal infection. The tubes and ovaries show intimate massing and a gradual enlargement of the tubes from the proximal to the distal ends. Both tubes are filled with thick purulent material, and in both the fimbriated portions show complete inversion, and complete sealing over of the peritoneal surface.

Microscopic Examination.—Section (*a*) shows a thin wall infiltrated with small round cells and exhibiting atrophy. The rugæ are diminished in number and many are short and dome-shaped. The stroma is densely infiltrated with small round cells. The lumen contains a large mass of degenerated pus cells.

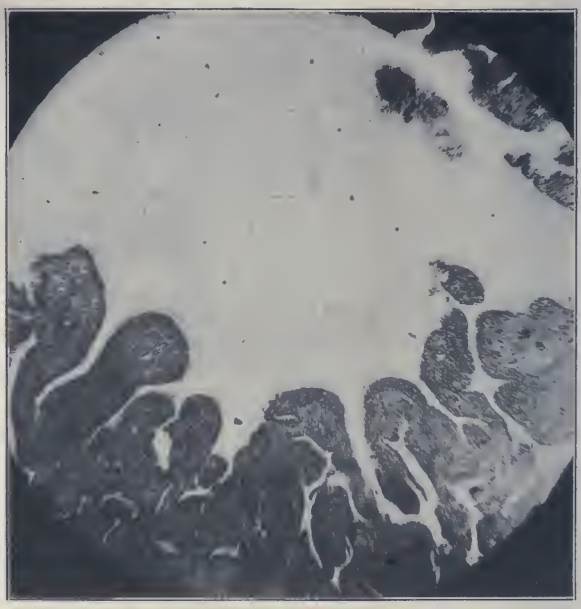
Section (*b*).—The tubal wall is diffusely infiltrated with small round cells, the majority of which are eosinophiles. The muscle has been extensively replaced by connective tissue. The mucosa

shows a small number of folds which tend toward dome shapes. The lumen is filled with degenerating pus cells.

Section (*c*) exhibits the same changes as seen in the right tube, except that the peritoneal surface is densely thickened by a purulent exudate. The mucosal portion shows deformed folds, many of which are much flattened and extensively fused. There is marked hyper-



20 Receding Chronic Salpingitis



Case XX.

Upper.—Drawing of gross specimen.
Lower.—Photomicrograph of section taken at "a" in the drawing, showing rounding effect upon the end portions of the folds.

emia and extensive red blood-cell extravasation. The lumen contains a large mass of pus. There is active exfoliation of epithelium.

Section (*d*) consists of ovarian and tubal tissue, two trans-sections of the tube being included. There is intimate fusing of tubal and ovarian issues, the pus-cell infiltration invading both types of tissue, the tubal tissue being more extensively involved. The rugæ

are greatly enlarged and the end portions rounded. The lumen contains a large amount of pus.

CASE XX.—Receding Chronic Salpingitis.

The gross specimen is a Fallopian tube of moderate size showing gradual enlargement of the tube toward the distal end, and an enlarged cyst of Morgagni. The ostium is not tightly closed, but the fimbriæ are almost completely inverted. The companion tube showed complete inverson of the fimbriæ and complete sealing of the peritoneal portion of the ostium.

Microscopic Examination.—Section (*a*).—The peritoneal surface exhibits an occasional lymph node, and the outer muscularis shows aggregations of lymph cells. There is connective tissue replacement of the muscle bundles. The rugæ are hypertrophic and hyperplastic, and have broad bases and rounded end-portions. There is practically no lateral fusing, and almost no desquamation of the epithelium. The musosa shows a diffuse infiltration of small round cells, mostly mononuclears. At the fimbriated end there is a hypertrophied cyst of Morgagni.

CASE XXI.—Chronic Pyosalpingitis and Extensive Ovaritis, with Early Cystic Degeneration of the Ovary, and with Fusion of a Calcified Appendix with the Distal End of the Tube.

Aged thirty-two years. Chief symptoms, abdominal pain. Operation was appendectomy, removal of right ovary and tube, removal of fibro-myoma of the uterus.

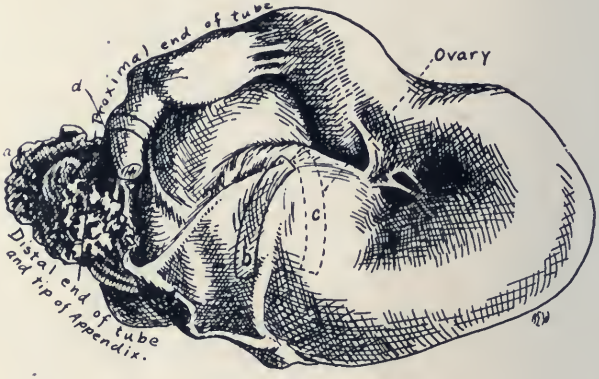
The gross specimen shows a Fallopian tube and ovary illustrating complete infolding of the distal portion of the tube with massed ovarian structures, the proximal and distal portions of the tube being within 1 mm. of each other. Massed fimbriæ are observed which have become hypertrophied, and which are pinched by the tightly-closed ostium.

Microscopic Examination.—Section (*a*).—The tubal wall shows multiple foci of small round-cell infiltration, and also some diffuse infiltration of the same type, the cells being mononuclears, of which the majority are plasma cells. The lumen of the tube is wanting. In the position of the abdominal ostium there is portion of the appendix vermiformis, the mucosal part of which is undergoing calcification.

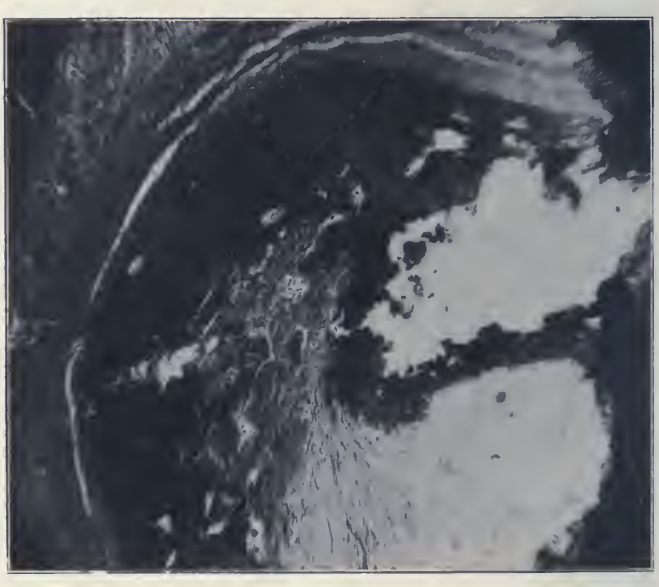
Section (*b*) shows a greatly dilated tubal wall with hyaline change in the muscle fibers, and also considerable atrophy of the same, and moderate infiltration with small round cells, many of these being eosinophiles. The mucosa shows marked deformity of the folds, which show both broad and narrow bases and greatly enlarged end portions. The folds are greatly hypertrophied and are diffusely infiltrated with mononuclear cells. The lumen is filled with pus-cell debris.

Section (*c*) consists entirely of ovarian tissue which is infiltrated in certain portions with small round cells of mixed types. On one side is a large infected Graafian follicle. There are numerous well preserved Graafian follicles. Marked dilatation of blood vessels is observed.

Section (*d*) shows focal infiltrations in the tubal wall, connective-tissue increase, and marked flattening of rugæ. The lumen contains considerable pus cell debris.



21- Chronic Pyosalpingitis and Ovaritis and Fusion of Appendix and Distal Ostium. Age - 32 yrs.



CASE XXI.

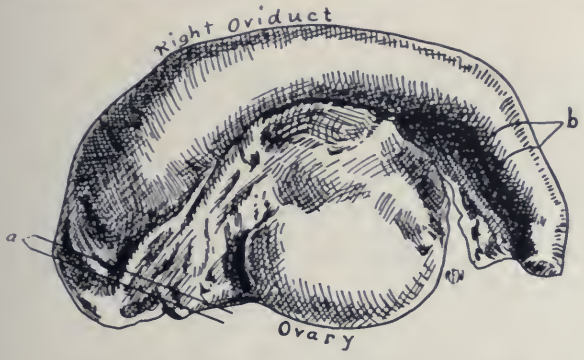
Upper.—Drawing of gross specimen.
Lower.—Photomicrograph of section taken at "a," distal end of oviduct, showing a portion of fused appendix vermiformis.

CASE XXII.—Late Acute Gonorrheal and Streptococcic Salpingitis and Severe Peritonitis with Exacerbation Due to Abortion One Month Previous to Operation.

Aged sixteen years, married two years. Pregnant once, with abortion at two months. Interned for venereal disease.

The gross specimen shows partial infolding of the fimbriated end of the tube, and massing of the ovary. The fimbriæ have disappeared, and the proximal end of the tube is distinctly fibrous. The companion tube shows gradual enlargement toward the proximal end, and almost complete inversion of the fimbriæ.

Microscopic Examination.—Section (*a*).—The peritoneum is greatly thickened and diffusely infiltrated with small round cells,



22 - Late Acute Gonorrheal and Streptococcic Salpingitis and Peritonitis. Age 16 yrs.

CASE XXII.
Drawing of gross specimen.

a large number of which are of the plasma type. There is extensive red blood-cell extravasation and considerable formation of young connective tissue. The blood vessels are moderately hyperemic. The rugæ are hypertrophied and show rather extensive lateral fusing. The stroma is densely infiltrated with pus cells, and the lumen is markedly diminished in size. There are numberous fimbriæ in the mucosa. Extensive exfoliation of the epithelium is observed.

Section (*b*) shows the same essential changes as observed in Section (*a*), with the exception of a much greater connective tissue increase and a larger proportion of mononuclear cells in the infiltration process.

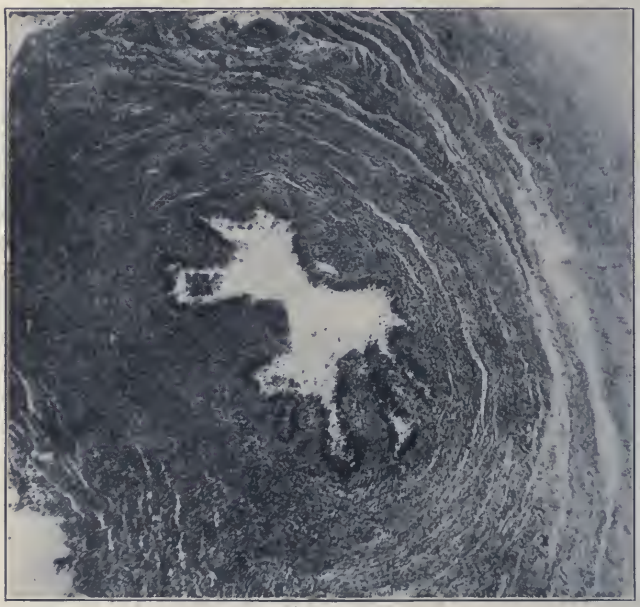
CASE XXIII.—Case of Bichloride of Mercury Poisoning.

Aged twenty-five yeas. Has had two full-term children and six abortions. Death occurred eleven days after the ingestion of two tablets (3 and $32/50$ grains) of bichloride of mercury and the insertion into the vagina of one tablet (1 and $41/50$ grains) which was held in place at the cervix by a tampon.

Gross Condition found at Autopsy.—The vaginal mucosa was gangrenous throughout its entire extent. There was a bilateral laceration of the cervix which had served to hold the bichloride tablet until dissolved. The result was gangrene of the lower portion of the cervix with a sloughing of a relatively large part of the vaginal por-

tion of the cervix. The line of demarcation between gangrenous and unaffected tissue extends to within 5 mm. of the internal os.

Microscopic Examination.—No change in the peritoneum and muscularis other than hyperemia. The tubal isthmus of the right side shows but four primitive folds. The epithelium exhibits recent exfoliation. The nuclei are hyperchromatic. The relative intensity of staining qualities as compared with the nuclei of muscle and connective tissue is quite marked. The left tube shows the same changes as the right, except that there is more marked exfoliation of epithelium.



CASE XXIII.

Photomicrograph. Trans-section of Fallopian tube in case of bichloride of mercury poisoning, showing active desquamation of epithelium.

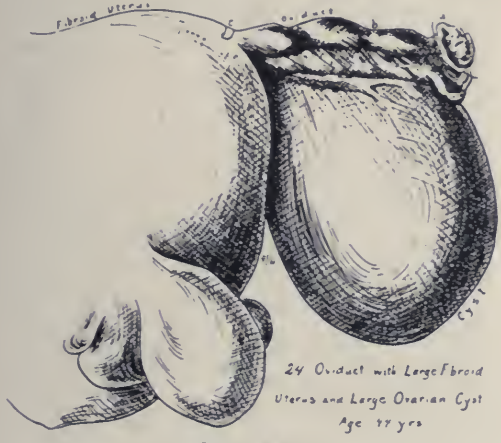
Five additional sections taken from mid- and distal portions show the same essential changes of hyperemia and extensive epithelial desquamation and hyperchromatosis. In many instances the stromal portions of the folds are entirely bared of epithelium. The exfoliated epithelium shows a marked granulation, or better, perhaps, a disintegration of cell nuclei and protoplasm. In the stroma the dilated small blood vessels filled with hemolyzing red blood—cells are prominently seen in each section. Occasionally there are small portions which have suffered from earlier exfoliation than that seen in the greater part of the sections.

CASE XXIV.—Fallopian Tube in Extensive Fibromata of Uterus and a Large Ovarian Cyst.

Aged forty-four years. Duration of condition, two years. Chief

symptoms, menorrhagia and abdominal pain. Operation, hysterectomy.

The gross specimen consists of a uterus with Fallopian tube and ovarian cyst. It is markedly irregular in outline, because of multiple fibroid tumors varying in size from that of a pea to that of a goose egg. These have varying sized pedicles and subserous attachments. There are numerous additional fibroids in interstitial and sub-mucous positions. The gross mass is equal in size to that of an average adult head. Upon the left side there is a cystic mass about the size of an orange, which is attached by a pedicle to the uterine tumor mass. Along its upper border is seen the Fallopian tube, which is from 1 to 2 cm. above the cyst.



CASE XXIV.
Drawing of gross specimen.

Microscopic Examination.—Sections taken at (*a*), (*b*), and (*c*) show evidence of very slight inflammatory change. Only a few small focal aggregations of lymphocytes are observed. There is no other change, except some hypertrophy of the circular muscularis and primitive folds of the uterine ostium. The large cyst beneath the Fallopian tube is attached by a pedicle to the peripheral surface of the distorted fibroid uterus.

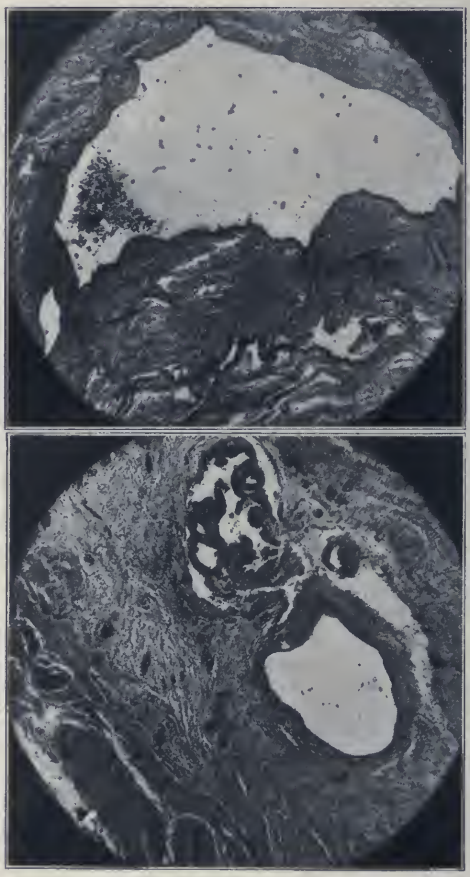
CASE XXV.—Old Chronic Healed Gonorrheal Salpingitis with Multiple Lumina.

Aged forty-three years. Chief symptoms, abdominal pain.

The gross specimen is that of a Fallopian tube approximately divided into halves. One half has a diameter equal to an index finger. It is distinctly resistant to pressure, and is of a shiny white color. The other half shows relatively but little enlargement, and presents a number of rice-like bodies upon the under side. These bodies, however, when punctured prove to be small cysts. These miliary cysts were mistaken clinically for tubercles.

Microscopic Examination.—Section (*a*) at the distal portion of the tube shows marked hypertrophy of wall, with an occasional focal

-25- Old Chronic Healed Gonorrheal Salpingitis with Multiple Lumina Age-43yrs



CASE XXV.

Upper.—Drawing of gross specimen.
Middle.—Photomicrograph of section taken at "a" in drawing.
Lower.—Photomicrograph of section taken at "c" in drawing, showing irregularity of lumen.

infiltration of lymphocytes, and areas of marked fibrosis involving extensively the mucosal and submucosal portions. The mucosal folds in places show fusing and marked hypertrophic and hyperplastic deformity. The tube shows a double lumen, and in one of the tubal structures the folds have entirely disappeared, while in the other they are found present. The epithelium is extensively changed, being largely of very low type, and in places entirely destroyed.

Section (*b*).—The wall shows a marked increase of fibrous tissue, some congestion, and some lateral fusing of tubal folds.

Section (*c*) exhibits marked increase of fibrous tissue, with a multiple lumen. At one part there is a cross section of typical uterine tubal ostium, and at the side of this are two tubal structures, one larger than the other and without folds. The other lumen is quite small. All portions of the lumina have an epithelial layer of the same type. This tube exhibits a well-defined double lumen, and also evidence of a small tubular formation which extends through part of the length of the tube.

CASE XXVI.—Retrogressive Changes in Pregnancy of the Left Tube with Concomitant Carcinoma of the Cervix Uteri.

Aged thirty-seven years.

26 Retrogressive Changes in Pregnancy of the Left Tube with Concomitant Carcinoma of the Cervix Uteri. Age 37 yrs.

CASE XXVI.
Drawing of gross specimen.

The gross specimen consists of a uterus, right and left Fallopian tubes, and one ovary. The uterine cervix shows marked destruction from a new growth process which extends to above the level of the internal os. The Fallopian tubes are both small in size, the proximal portions being 3 mm. in diameter. The right tube is this size throughout, while the left tube at a distance of 3.5 cm. from the uterus exhibits a rounded enlargement extending through 3 cm. of the length of the tube, and measuring 2 cm. in cross diameter. The tube beyond this enlargement shows an average diameter of 9 mm.

Microscopic Examination.—Section (*a*) represents the distal portion of the tube. The changes from normal are very slight, and consist of some hyperemia and slight mononuclear infiltration about

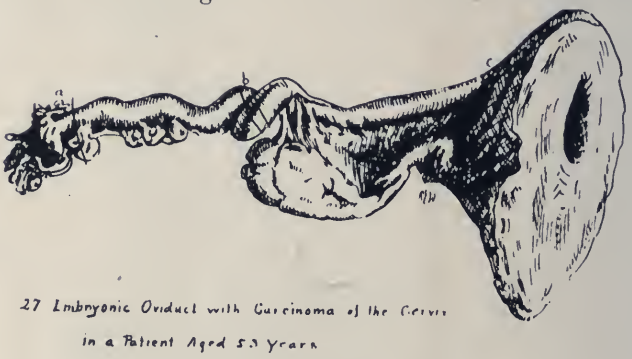
the larger blood vessels. A small amount of edema is observed. Some of the mucosal folds show slight hypertrophy, and the epithelium shows very little congestion.

Section (*b*) exhibits a laminated blood clot, numerous chorionic villi, and considerable amnion. The enclosing tubal wall is thin and in places shows small round-cell infiltration, and moderate edema.

Section (*c*).—The proximal portion of the left tube exhibits slight edema and dilated blood vessels, now contracting. There is hypertrophy of the submucosa. The epithelium is well preserved, showing some villi.

CASE XXVII.—Embryonic Oviduct with Carcinoma of the Cervix Uteri, in a Patient Aged Fifty-three Years.

Aged fifty-three years. Duration of condition, three months, with constant hemorrhage.



CASE XXVII.
Drawing of gross specimen.

The gross specimen consists of a uterus, Fallopian tubes, and an ovary. The uterine cervix is involved in a carcinomatous process. The Fallopian tubes are small and normal, except for their embryonic morphology in the outer half of each tube. These show definite embryonic folds just distal to the mid-points, and beyond the twisted portions are wave-like formations. The ovary is small and atrophic. The drawing exhibits one tube, ovary, and a portion of the uterine cornu.

Microscopic Examination.—Section (*a*).—The fimbriæ are massive and show an unusually large amount of connective tissue of a more mature type than is usually seen in the stroma of normal fimbriæ. The stroma is more cavernous than normal. The epithelium is well developed.

Section (*b*).—The adventitia occupies more of the thickness of the wall than is usual. The longitudinal muscle layer is not easily defined; the circular layer is thicker than normal, and there is no well-defined mucosa. The plicæ are markedly deformed from hypertrophic and hyperplastic changes, leaving but little lumen space. The epithelium is of low-cell type, the nuclei being almost entirely round and oval shaped.

Section (*c*) shows a wall exhibiting marked compactness, and consisting almost wholly of connective tissue. The lumen is small, and only two primary folds are seen.

CASE XXVIII.—Chronic Bilateral Staphylococcic Salpingitis and Ovaritis.

Aged forty-four years. Duration of condition, one year. Symptoms, pain in lower left iliac region and irregularity of menstruation.

28 Chronic Bilateral Staphylococcic Salpingitis and Ovaritis Age - 44 yrs

CASE XXVIII.
Drawing of gross specimen.

The gross specimen includes uterus, oviducts, and ovaries removed by hysterectomy. The uterus is enlarged and the tubes fold closely about the ovaries in such a way that gross differention of these structures is impossible. The tubes are enlarged equally, and the changes are approximately the same on both sides.

Microscopic Examination.—Both tubes exhibit the same relative enlargement and a corresponding similarity of pathological changes. The distal ends of the tubes definitely surround the ovaries.

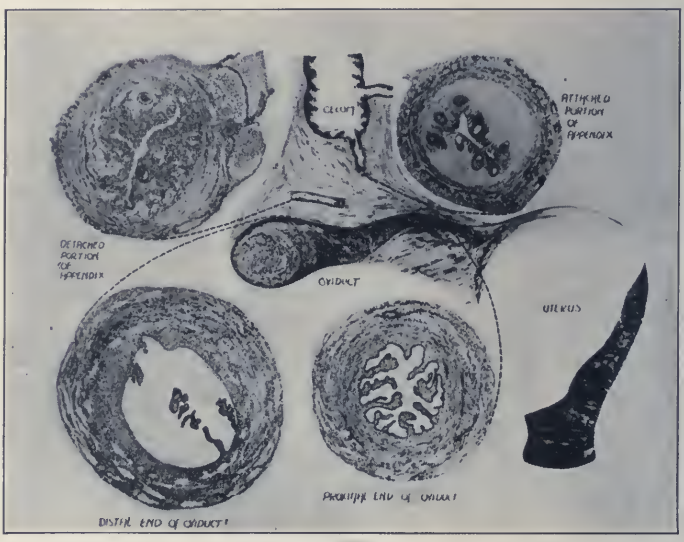
29- Fallopian Tubes of New-Born Child - at Term

CASE XXIX.
Drawing of gross specimen.

The sections show a large number of focal lymphocytic infiltrations through the walls of both tubes. Extensive connective tissue hyperplasia is taking place. The lumina are filled with a serous fluid, and masses of red blood cells. The mucosa and sub-mucosa are greatly deformed and diffusely infiltrated with mixed types of cells. The rugæ have almost entirely disappeared. The epithelium has been extensively destroyed.

CASE XXIX.—Fallopian Tubes of New-born Child at Term.

Case XXX.—*Summary of Case History.*—Unmarried woman aged twenty-six years with no previous illnesses excepting attacks of appendicitis, the last attack having been severe enough to make confinement in bed necessary for a period of three weeks. There is no history of venereal disease or of exposure to the same.



Case XXX.

Microscopic drawing. Pyogenic infection of the right oviduct, secondary to suppurative appendicitis, the distal half of the appendix having been separated from the proximal half so as to be closely contiguous to the oviduct. The drawing shows trans-sections of appendix and oviduct.

Operative Findings.—The right oviduct was gradually and uniformly distended in its distal half, the enlargement reaching a diameter of 15 cm. The fimbriæ were completely inverted and this portion of the oviduct was contiguous to a separated but adherent distal half of the appendix vermiformis. A complete closure of the appendix had taken place and adequate blood supply had been developed for the separated portion.

THE TREATMENT OF VAGINAL DISCHARGE.

BY

GEORGE CHANDLER, M. D.,

Kingston, N. Y.

THIS paper is in no sense a scientific discussion of the subject, but aims merely to describe briefly a practical method of curing summarily one of the most annoying conditions which present themselves to the physician.

I will not enumerate the causes of vaginal discharge, well known and understood by all, but will confine myself to those cases commonly, though improperly, called leucorrhea.

Of course, pathological conditions producing a discharge, such as endometritis, salpingitis, and the like, must be sought for and eliminated. But there are cases of vaginal discharge produced by endocervicitis, and an unhealthful condition of the vaginal mucous membrane, which one sees almost daily in an active gynecological practice. It is the treatment of these cases of which I intend to speak.

Such cases are usually treated in clinics by the use of tampons saturated with boroglyceride, ichthyol, argyrol, or nitrate of silver, the patient returning for treatment, week after week, showing an almost too gradual improvement. Even while working under such good gynecologists as Lusk, Clement Cleveland, Pyror, and others, in the large Gynecological Clinics of New York, I found the results unsatisfactory.

After years of discouragement, it occured to me that possibly douching and moisture might be aggravating the trouble, and that if the vagina could be kept dry, the mucous membrane might heal more rapidly, on the same principle that chronic skin lesions, such as eczema, do better when kept free from all moisture.

A treatment, which I call the "dry treatment" took form in my mind several years ago, and was gradually worked out after much experimenting. I am now using it in all cases such as those cited above. It consists of six treatments.

After we have made sure that we have a true case of chronic discharge, not due to laceration or to some acute condition of the

uterus and its adnexa, the patient is told to present herself for treatment one week after the cessation of her menstrual period.

Through a bivalve speculum the cervical canal is swabbed with pure carbolic acid on a probe wrapped tightly with a pledglet of cotton. If there are granulations on the cervix, these are also swabbed with the carbolic. This is not neutralized with alcohol.

Sometimes the first treatment causes pain, but the pain usually subsides immediately. Then the entire vagina is painted with a weak tincture of iodine. To make this of the proper strength one dram of U. S. P. tincture of iodine is diluted with nine drams of alcohol.

The vagina having been thoroughly painted, is then packed with dry sterile gauze. This packing should be carefully done, both anterior and posterior fornices being filled, and enough gauze used to distend completely the vagina so that there shall be no folds left; the gauze should not be allowed to protrude from the vulva, so there shall be very little moisture from the absorption of urine.

The patient should return on the second day, when the gauze is removed, and exactly the same treatment is repeated. This procedure is repeated every other day for three treatments, even if on inspection the cervix and vagina appear to be red and somewhat excoriated.

At the end of that time, three treatments of a different nature are substituted also every other day. In these the vagina is not swabbed, but only packed with sterile gauze in whose meshes is incorporated a powder made of equal parts of starch sterate of zinc, and boracic acid. The packing is done with the same care as before described.

The two series of treatment have now covered about twelve days. The packing is then removed, and the patient told to remain away until a week after her next menstrual period, when she is to report again. Frequently patients come in only to say that all discharge has disappeared, and that they are perfectly well.

If there is a slight return one treatment only of the carbolic acid and iodine is used, and on the second day thereafter the dry powder treatment is given once. A week's rest is followed by one more dry powder treatment, which completes the cure. I have found that, if no cure is effected, there exists some underlying cause, which has escaped me. At no time during the treatments is the patient allowed to use a douche.

The results of this simple method, during the past few years, have been so satisfactory that I feel reasonably sure of success in many of the cases I formerly dreaded to see entering my office.

I have suggested this treatment to a number of other physicians who, since using it, have become convinced that the principle of keeping the vagina dry, and stretching out all the folds, is correct; though, possibly, other forms of medication, employed with this underlying principle, may achieve the same result.

The above method is successful also where gonorrheal diplococci are present after the acute stage is over. General conditions such as anemia, constipation, intercurrent disease must, of course, be taken into account and should be given proper care.

While I do not deny that the methods depending upon the hydroscopic value of drugs, antiseptic douches and tampons, often succeed in effecting a cure, it must be admitted that a long period of time is necessary to rid the patient of her trouble. Therefore, a method which has been found to effect a cure in six to eight treatments, seems to me to be of value.

DISCUSSION ON THE PAPERS OF DRS. O. H. SCHWARZ, J. E. DAVIS AND CHANDLER.

Dr. William E. Darnall, Atlantic City, New Jersey.—I think I can endorse Dr. Chandler's method of treatment of these very troublesome cases, because I have been working along the same line for a number of years. With the old fashioned ichthyol and boroglycerid tampons I have not had very good results with this type of discharge. About the only place they are effective is where your patient has a cellulitis, or something of an inflammatory nature, up above the vagina, and you want to produce an hygroscopic effect. The powder I use differs from that of Dr. Chandler's in that it contains a small percentage of zinc sulphate for its astringent effect.

This proposition of vaginal discharges is a large one; it has many sides to it, and we must determine first whether the discharge is coming from the uterus or the cervix, or whether it is purely a vaginal discharge. I believe a very large proportion of them are limited entirely to the vagina, or to the vagina and the cervix. Perhaps the latter is the most common class.

One thing Dr. Chandler has not mentioned, which I think is very important, and that is the type of case in which we have a thick, tenacious mucous plug in the cervix. All the swabbing will not do any good unless you remove this plug from the cervix. The best way to do this is to use some alkaline solution to dissolve the thick, mucous plug, then the application will go right to the glands that are diseased and cauterize them.

The method I have used to get rid of the plug is this: I use a solution of bicarbonate of soda, sodium chlorid, and sodium biborate, about a teaspoonful each to a quart of water, making an alkaline solution. This will dissolve the mucous plug. I use a deep urethral

syringe which must be made of silver so that it does not corrode. This is fitted to the ordinary Luer glass syringe. A small quantity must be measured out so that do not put too much in the uterus and produce uterine colic. A simple injection of this fluid slowly introduced into the uterus dissolves the mucous plug and you can wipe it out with a little swab. Then you can apply your solution on a swab to the cervical canal.

Another important point is that these vaginal secretions, with the red, inflamed, vagina, are usually very acid; and often produced by a bacillus coli communis infection. In making up his powder and introducing it, I would suggest that Dr. Chandler add bicarbonate of soda or some other alkaline agent, and, sometimes, sulphate for its astringent effect.

Dr. H. Wellington Yates, Detroit, Michigan.—I have been very much interested in the first paper, as well as in the last one. The first because it teaches some fundamental principles in regard to pathology which have a twofold bearing. One in particular with reference to the ramifications made by the disease as portrayed in one of the pictures of the tube. Some of these tubes return to their normal condition so far as feeling and sensibility of the patient are concerned, so that they do not know they had had a tube which at one time was very much inflamed and very sensitive; and yet we find in opening these patients later for some subsequent trouble, and in an attempt to find the cause of sterility, we endeavored to pass a fine pointed silver probe through the tube, but were unable to effect its passage. Of late, I have been trying in a rather general way to pass a long narrow pointed silver probe down through the lumen, and I have signally failed in many instances where I thought the lumen and the tube were normal. Again, it has a very practical bearing in the fact that these fimbriæ are opened up to new avenues and hold an old gonorrheal infection in the cells, so that every likelihood of infection, either of the wife or husband, or of any other individual, is possible; but in cases of prostitutes in particular, the infection may last a long time. In women who have become pregnant there are instances in which infections of marked degree follow labor. These are instances in which, I am sure, all have a practical value.

I was mighty glad to hear Dr. Chandler's paper, and I am going to carry out some of the plans he has suggested to us. If he can make the treatment of leukorrhea and these pernicious discharges so simple, I want to put them into effect. I have been using the dry powder treatment for some time, but I do not think I have used it frequently or, perhaps, intelligently enough.

Dr. Davis (closing the discussion).—I have very little to add, except that I have been greatly surprised at the persistency of the tubal epithelium, and at the wonderful ability also of the folds to return to normal, illustrating that when nature has an organ with which she performs a very important function, she provides a very adequate protection for that organ.

If I had occasion to bring out all points that came up in this

study, we could drive home the lesson that the tube has a number of means of protection, perhaps among the chief of these are the methods by which the ostia close.

The internal ostium has a very efficient closure, so that the injection of fluid under a good deal of pressure into the uterine cavity will not pass into the tube, and, on the other hand, the ostium abdominale has a very interesting mechanism which protects that end of the tube very well against any peritoneal infections.

The case of Dr. Hayd, I think, is particularly interesting. I assume in that case the ostium abdominale closed fairly early and the infection was carried through that ostium, and after closure the patient, being a vigorous, splendid looking Swedish woman, as Dr. Hayd would tell it, had splendid tissue resistance. The secretions within the tube, I think, were very abundant, and caused the enormous distention of the tube shown in that particular case, making it a very splendid illustration of the protection afforded by efficient closure of the ostium abdominale.

THE BURIED LOOP OPERATION FOR SHORTENING THE ROUND LIGAMENTS.

BY

JOHN NORVAL BELL, M. D.,

Detroit, Mich.

(With two illustrations.)

It is not the intention of the writer to discuss the merits or demerits of the many Round Ligament operations. Suffice it to say, the question—"Which is the best method for operative treatment of retro-deviations of the uterus" is still a moot one.

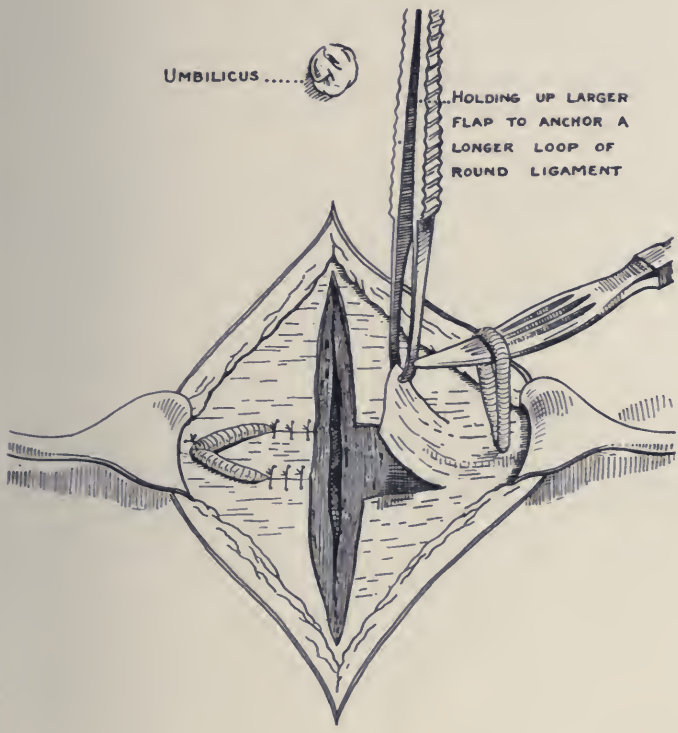
Proof of this statement is found in the perusal of some of the more recent writings of prominent gynecologists of America and Great Britain. For instance, in the "Atlas of Operative Gynecology" by Hirst of Philadelphia, published in June of this year, under the caption—"The Operative Treatment of Retroversion of the Uterus, we read: "The old suspension operation introduced into this country by Kelly, the operation of Dr. Gilliam with all its modifications, Baldy's operation, Webster's operation, Coffey's operation, as well as the older operations of Dudley and Mann have all been tried and given up." Also in "The Principles of Gynecology" by W. Blair Bell of London, England, under the heading of "Gilliam's Operation" we read: "This operation is employed by most of the best operators of America and the author has, after an extended trial, become convinced of its merits."

The writer, for some time, believed the operation of Dr. Gilliam to be the nearest approach to a satisfactory procedure for the cure of this condition, and yet, it has been my misfortune to have an occasional failure. This occasional failure, I am inclined to attribute to a faulty union between the serous covering of the tube and the aponeurotic fascia to which it is attached, allowing the loop to slip back gradually into the abdominal cavity, as it hardly seems possible the thick, heavy proximal portion of the ligament could become so stretched and lengthened out as to allow the fundus to drop back into the retroverted position.

With these thoughts in mind I have devised the following operation which, with your permission, I will briefly describe and submit for your consideration.

The usual median incision having been made, the necessary attention given the pelvic pathology, the round ligaments are then brought out through a perforation of the abdominal wall as in the the Gilliam operation. A strip of fascia from one-half to one inch in width is now cut transversely and dissected from the rectus as

Plate 1.



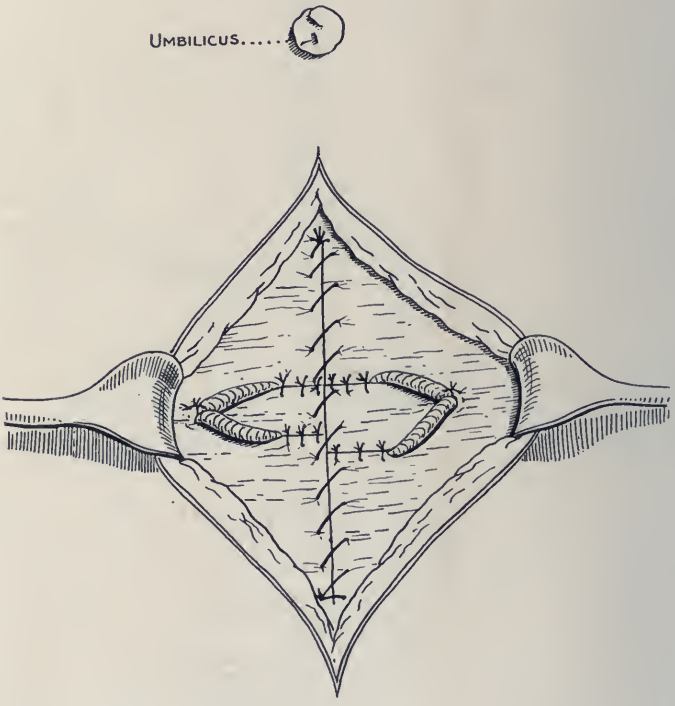
"Buried Loop" Operation
For Shortening Round Ligaments of Uterus.

illustrated in drawing No. 1. The fascial flap is drawn through the loop of ligament replaced in its original position and sutured there. Thus you will observe, the loop of the ligament is buried underneath the fascia and cannot escape and slide back into the abdominal cavity.

Not infrequently the loop of ligament on one side is shorter than

the other. Where such a condition exists the fascial flap can be cut narrower. In other words the flap can be cut to accommodate the length of loop. It will be seen, therefore, that we have the freshly cut edges of the fascia lying in apposition and union should be firm and prompt. It is understood that all necessary plastic work should be done in the perineum and vagina.

Plate II.



"Buried Loop" Operation
For Shortening Round Ligaments of Uterus

DISCUSSION ON THE PAPER OF DR. BELL.

Dr. Albert Goldspohn, Chicago.—Mr. President: the doctor's creditable modification and general technic is within the bounds of what I consider fundamental principles in correct retroversion surgery. However, I would say in regard to this, and in regard to the Gilliam operation, that in order to have thorough and stable results,

it needs to be amplified in one direction, viz., in order to make the fundus uteri rest against the abdominal wall just above the bladder more thoroughly and uniformly, the round ligament must be separated from the tube by severing the peritoneal coat that envelopes both of them near their origin, so that the loop of round ligament, which must take in a generous portion of its enveloping peritoneum, will exercise its lifting function more directly upon the fundus itself. The latter should not only leave no space between itself and the abdominal wall, but also leave no free space between itself and the bladder. Such innocent suspension of the uterus added to the correction of the retroversion is usually required in order to obtain more nearly uniform and satisfactory clinical results in those cases that really need an operation for such displacement; and there will never be trouble from intestinal parts becoming entrammeled as the result of the operation.

Dr. Abraham J. Rongy, New York City.—Dr. Bell will doubtless be glad to know that the principal of the operation he has described, was described by Dr. Goodwin of Staten Island, in the New York Medical Journal, about two years ago. After pulling the loop of the round ligament through, he never stitches it, but puts three stitches into the muscle underneath the round ligament so that it slides over the muscular tissue and in that way offers no chance for it to slip back.

Dr. G. Van Amber Brown, Detroit, Michigan.—For a number of years I used the Gilliam operation, but more recently I have not done so. The chief thing that stopped me from using it was the fact that I had two cases of intestinal obstruction following the Gilliam operation. The Gilliam operation is all right in principle so far as using the strongest part of the ligament, but it is wrong in that it does not pull from the natural direction. Another objection to the Gilliam operation in my mind is that when you puncture the sheath of the muscle you create potentially a hernia area at that point. Therefore, for the last few years I have adopted the method of going between the muscle and the sheath over to the internal ring, taking hold of the ligament at the junction of the outer and the middle thirds, and, pulling it up through, you have then two-thirds of the ligament through, which gives you ample anteflexion of the uterus and you have the support pulling in a normal direction by the inner third, the strongest point of the ligament. You get rid of the space which in the Gilliam exists between the ligament and the abdominal wall permitting the intestine to loop through and strangulate. After the ligament is drawn through the ring you can split and attach it to the sheath and get firm union.

Dr. Rufus B. Hall, Cincinnati, Ohio.—The last speaker has told us that he has had hernia following the Gilliam operation, and also intestinal obstruction. I was the first man to perform the Gilliam operation after he described it. When he first described it, the morning I read a description of it I was going to operate that day and made the operation as described by him. That was the only operation I performed according to the Gilliam technic. I

modified it immediately in the second case I operated on. I made it in accordance with the principle suggested by the last speaker (Dr. Brown), and have done so ever since. It is an ideal operation because it prevents hernia, and there is no possibility of hernia developing after the operation. (Dr. Hall illustrated and described his modification of the Gilliam operation on the blackboard.)

I have had dozens of women who have borne children, some of them three children, after this operation as modified by me. The uterus stays forward. If you do the perineal work that should be done, the patient is perfect and does not have any cystitis or a retroverted uterus. I have made this modified Gilliam operation many, many times, and I shall continue to perform it in all cases in which it is necessary to fix the uterus forward. I rarely operate for a retroverted uterus alone, but employ this method to fix the uterus forward in all cases in which that is required, when the abdomen has been opened for some other purpose. This operation can be done in a few minutes and leaves the patient as God Almighty intended her to be.

I am surprised that anybody is doing the operation as Gilliam described it, because it is not a correct operation in its principle.

Dr. Arthur T. Jones, Providence, Rhode Island.—In regard to the Gilliam operation, like Dr. Brown, I did this operation a number of times and had the unfortunate experience Dr. Brown has had—having a case of intestinal obstruction following it. I had two other cases in which the ligament pulled through and retroversion of the uterus recurred.

For the last year and a half I have been doing an operation similar to the one described by Dr. Brown on the blackboard, excepting that I go over on top of the fascia, split the intercolumnar fibers, and do a regular Alexander operation, bring the ligament out, and bring the uterus up against the abdominal wall, sew the ligament between the edges of the external oblique, and cut off the redundant portion. It is practically the Alexander operation, but done with the abdomen open. It makes a good operation. It pulls the ligament out and leaves nothing inside to cause obstruction. I have done 35 cases by this method, and it works nicely, indeed.

Dr. Gordon K. Dickinson, Jersey City, New Jersey.—Obstetricians have not yet decided how best to deliver a baby, and the gynecologists have not yet decided how to shorten the round ligament. There are two hundred different operations or retrodisplacements of the uterus, and with most of them too much surgery is done. The statistics gathered by Polak, and by Dährsœn, on the other side of the ocean, are to the effect that of all the different methods for retrodisplacements of the uterus the one that stands at the head and is considered the best is the good old fashioned Alexander. There is very little surgery to that. (Here Dr. Dickinson described and illustrated the Alexander operation on the blackboard.)

Dr. Bell (closing the discussion).—Dr. Goldspohn says it is necessary as a fundamental principle that the fundus of the uterus

be brought up against the abdominal wall. If Dr. Goldspohn will do the operation I have described he will find that it brings the fundus of the uterus against the abdominal wall.

As to the remarks of Dr. Brown, I was quite surprised to hear what he said about the Gilliam operation because I have understood, and I believe it is quite universally understood, that it is an accepted operation.

Dr. Hall brought out the point of drawing up the loop. If you dissect up enough loop you take up all the slack which runs towards the internal ring, and as Dr. Hall has said there is no space for anything to get in. As a matter of fact, how often do we see in the literature reports of cases of obstruction of the bowels due to the Gilliam operation?

DR. HALL.—Gilliam does not draw up the outside part in the operation.

DR. BELL.—This operation does that. You pull it up and it goes there directly across to the ring, and there is no space for anything to get into. You will not get obstruction of the bowel if you follow this method.

I have been pleased with the discussion. I would like some of you men to try this operation and see how you like it, and report on it next year.

CLINICAL FACTS CONCERNING THE STEM-PESSARY.

BY

THURSTON SCOTT WELTON, M. D., F. A. C. S.,

Brooklyn, N. Y.

In 1803, Möller introduced the uterine stem-pessary into operative procedure. Alexander J. C. Skene, over forty years ago, wrote to the effect that the stem had a limited usefulness, and when employed with poor judgment caused infection.

Within recent years the stem has grown in favor, especially with the physician at large. From observations of women who have been subjected to the introduction of a stem, we are forced to the conclusion that most pessaries are employed apparently without reason and frequently in the face of definite contraindications.

The accepted indications for the use of a stem are: 1. Amenorrhea. 2. Dysmenorrhea. 3. Sterility. 4. Endometritis.

Amenorrhea.—We have not used a stem-pessary in amenorrhea; therefore we are not in a position to draw clinical conclusions. Many, however, do employ this instrument in selected cases of amenorrhea. In an infantile uterus the stem is claimed to act the same as massage does to a muscle; it develops it. While we have had no experience with a stem in amenorrhea, we have observed its action in cases of sterility, the results of which we shall consider in a later paragraph.

Dysmenorrhea.—All cases of dysmenorrhea will not respond to the introduction of a stem-pessary. When it is determined that the symptom is caused by malformations of the cervical canal, or spasm of the internal os, the use of this instrument gives good results. Should it be employed for dysmenorrhea of different etiology, negative results ensue. In these types of dysmenorrhea we have found that the stem may even aggravate the symptoms.

Sterility.—In the treatment of sterility the use of a stem-pessary, without other additional forms of treatment, has not proved beneficial. This is especially true when this pessary is used in the presence of an infantile uterus. We have not observed that the action of a stem tends to develop an infantile uterus into a normal sized, healthy organ. Others will disagree with this statement. However, to achieve a pregnancy, it is necessary to do more than develop the

uterine muscle alone. We must not fail to remember that the uterus is not the only offending organ, but that the tubes, ovaries, and vagina are equally to blame. J. C. Polak, drawing conclusions from a study of 798 cases of sterility from his private practice, said: "In the true infantile uterus it is questionable whether much should be done. Our only pregnancy results in this type have been two ectopics and five miscarriages."

We do not believe flexion of the uterus is a cause of sterility. A uterus that can discharge its menstrual debris will permit of the entrance of a spermatozoon, provided the cervical secretions are normal.

Endometritis.—We have not used a stem for the relief or cure of endometritis. Endometritis is the result of underlying trouble, often remote from the endometrium itself. We feel all forms of treatment should be directed toward the primary cause of the pathology. For this reason we never treat the endometrium without directing our attention toward the correction of the underlying or causative lesions. To curette, swab the cavity of the uterus with chemicals, or insert a stem-pessary, has never had a beneficial effect, in our experience, unless we cured the cause of the endometritis.

Indications and contraindications: A stem-pessary is not to be used in the presence of infection. That a focus of dormant infection can be present in the deep crypts of th cervical glands, or in the structure higher up, and baffle detection, has been the experience of most men. Should an area of quiescent infection be overlooked, the presence of a stem may lead to grave complications. We must assume that all men are potentially infected. We are told that from sixty to ninety per cent. of the male population have been infected at some time in their existence. Many males with supposed cures show the presence of staphylococci in later years.

Given a simple infection not advanced beyond the internal os, a stem-pessary may readily be the means of transmitting it beyond nature's natural barrier; and what was a simple infection will be changed into a mixed one.

This instrument should not be worn in the presence of cervical erosions, because they signify the presence of an endocervicitis; it will traumatize and open up new avenues of infection. Some employ a stem-pessary even though a cervical endometritis exists. It is their habit to curette the cervix, and apply pure carbolic acid prior to introducing the stem. We do not believe a curette or chemicals can overcome the endocervicitis. The infection is deeply seated in the glands of the cervix. The curette, the cautery, or

chemicals have not, in our experience, given satisfactory results in such cases. In the instances we have seen, in which a stem was introduced notwithstanding cervical infection, we have been forced to conclude that the extension of the disease process was due to the effect of the stem-pessary. As a preventive of conception, the instrument is absolutely worthless.

Pathology Caused by Stem-pessary.—A stem-pessary traumatizes and irritates. It opens up new avenues for infection. However, it is not the degree of trauma that determines the morbidity, but rather the incidence of infection. The infection is in the crypts of the cervcial glands. The mucosa, when chronically infected, becomes swollen and often everted. About the external os the mucosa presents a circumscribed area of glandular proliferation. The continued congestion produces a hypersecretion from the gland structure. In time there occurs a hyperplasia and hypertrophy of the cervical connective tissue. In many instances these glands become occluded and cyst formation results.

When the infection invades the deeper tissues, an ascending lymphangitis may ensue. This may involve the parametrium through the lymphatics to the tubes, producing a perisalpingitis or an endosalpingitis, peritonitis, and ovaritis. The symptoms and findings are those of a chronic pelvic infection. The circulatory and lymphatic stasis which ensues causes a subinvolution, thereby increasing the liability to new infection and lessening the resistance to old infection. Prominent symptoms are menorrhagia and metrorrhagia. These result from the circulatory stasis and the intermuscular lymphangitis which has impaired the contractile power of the uterine muscle. A common symptom is lumbosacral pain. This is occasioned by the pull of the cervix on the thickened, tender uterosacral ligaments.

At the Long Island College Hospital, and at the Williamsburgh Hospital, in the Departments of Gynecology and Obstetrics, we have observed all the degrees of pathology here enumerated, and the use of a stem-pessary has been the exciting cause. Briefly, and by way of illustration, we offer for your consideration the following case records in abstract:

Case I.—Mrs. K. Aged nineteen years. Single. Acute flexion of the uterus and dysmenorrhoea. Stem-pessary was in place about three months when a leucorrhoeal discharge began, which became irritating in character. Cervix was found engorged and flat at the tip. Motion of uterus caused moderate sacral pain. Stem was removed, and treatment begun. Leucorrhoea lessened in amount,

and lost its irritating characteristic. Patient under observation about one year. Symptoms have not entirely abated. This is the most common type of case.

Case II.—Mrs. L. Aged twenty-five years. Married six years. Never pregnant. Never infected. Uterus acutely anteflexed. Stem introduced for dysmenorrhea, and completely relieved the menstrual pain. For first time in years patient did not have to seek her bed during the menstrual dates. Stem-pessary was worn six months. Two months after its removal dysmenorrhoea returned. Patient asked to have stem reinserted. This was accomplished under gas anesthesia. The instrument was in place about three months when patient contracted measles. Stem removed. Following measles, pain began in lower quadrants of abdomen. Examination revealed pelvic inflammatory disease. Usual treatment instituted. Symptoms abated, and patient moved to the country. Experienced constant suffering. Returned to city. Operation.

Case III.—(Dr. H. A. Wade has kindly permitted the writer to report this case.) Miss M. Aged twenty-three years. Telephone operator. Stem introduced for relief of dysmenorrhoea. She was a *virgo intacta*. It was with difficulty that the stem was introduced into the cervical canal without injuring the hymen. Her pelvis was normal. Five weeks later symptoms and findings of acute pelvic disease. This was followed by period of usual treatment. Finally operation was resorted to. Findings at operation, those of chronic pelvic inflammatory disease. Unfortunately, no pathological examination was made of the tissues removed.

Case IV.—Mrs. W. Married. Aged thirty-seven. Four children, three living. First delivery instrumental. Child lived six hours. Patient recites she had a "slight" fever post partum for a few days. Last three labors normal. Stem inserted to prevent pregnancy. After this she observed an increase in her vaginal discharge. The duration of her menses increased, the flow became profuse, and the "period" more frequent. She suffered backache. Her physician assured her this was not unusual, and prescribed medicine. Symptoms increased in severity. An examination revealed bilateral laceration of the cervix. Endocervicitis present in marked degree. Uterosacral ligaments tense and tender. Uterus retroverted. Mass felt in each fornix. Examination elicited severe pain. The stem-pessary was removed. Treatment started. Two months later, repair of perineum and amputation of cervix, double salpingectomy, left ovariectomy, and resection of right ovary. Right-sided pain since operation.

Conclusions.—In the absence of infection, stem-pessary may be introduced, provided the patient refrains from sexual relations while the stem is in place, puts herself under constant observation, and reports to her physician at the first indication of trouble.

We do not condemn the stem-pessary as an unnecessary instrument. It gives excellent results in properly selected cases of dys-

menorrhoea. Otherwise our results with this instrument have been negative.

A stem-pessary may be the starting point, the exciting cause, of pathology, such pathology either limited to the cervical tissues or invading the deeper structures and ascending and involving the field higher up.

From these conclusions we make the plea that the use of the stem-pessary, often held lightly and without appreciation of its contra-indications and dangers, be discouraged in the hands of the casual gynecologist ignorant of its menace to the welfare and health of the patient.

DISCUSSION ON THE PAPER OF DR. WELTON.

Dr. K. Isadore Sanes, Pittsburgh, Pennsylvania.—I have been using stem pessaries in selected cases, and I have seen sterile patients get pregnant. Every one who uses a stem pessary must of course exclude tubal disease, and this demands gynecological experience. It demands also the exclusion of disease of the endometrium, as the author of the paper suggested. We must remember, however, that infantile uteri are oftentimes the result of endocrine insufficiency (hypo-function of the cortex of the adrenal, of the thyroid, and pituitary). In such cases the pessary will fail. There are unquestionably cases where the pessary does good. I never advise my patients against sexual relations while they wear the pessary.

Dr. Rufus B. Hall, Cincinnati, Ohio.—I use the stem pessary occasionally. I only use it in one class of cases, and in them it is of very great benefit to those young women with dysmenorrhea. There are some cases of dysmenorrhea that I am unable to relieve permanently by the use of the stem pessary or any other treatment. I believe that the stem pessary patient should be under the observation of the physician, and should report weekly while she is wearing the pessary, not for examination, but to report and keep a careful record of cases. I have been able to relieve many of these patients after two or three months of wearing the pessary when I have failed with any other method. Without it, I would not be able to relieve many of these patients. It is a dangerous proposition to use a stem pessary in every patient that comes to you with dysmenorrhea. One should always exclude infection and inflammatory diseases in the pelvis before you use the pessary which can be done with care in the diagnosis.

Dr. Gordon K. Dickinson, Jersey City, New Jersey.—Some years ago I had a woman come to me from across the river with a stem pessary embedded in a malignant uterus. Just as the doctor says, our cases should be watched carefully; they should not escape us by any means because the stem pessary, I think, is a very potent factor in malignancy.

Dr. Welton (closing the discussion).—From December 1, 1914,

to January 1, 1917, in my private work I employed a stem pessary in 47 cases. Of the 47, the records are incomplete in 8, leaving 39 for a basis of study.

The indications for the insertion of a stem in the 39 women were as follows: Dysmenorrhea, 25; sterility, 11; to prevent conception (pulmonary tuberculosis), 4.

The results obtained were: Dysmenorrhea, 16 cured; 2 were relieved while the stem was kept in place; in 7 there was no result, except in one the presence of a stem aggravated the symptoms.

As to sterility: In 6 cases the stem was used but aided by no other form of treatment. Of this number none became pregnant. The remaining 5 were given other treatment in addition to the stem and of this number one became pregnant and went to term.

To prevent pregnancy: Of the 4 cases, 3 conceived. One wearing the stem two months, and 2 after three months. The fourth woman developed pelvic inflammatory disease.

The morbidity from the use of the stem was: Pelvic inflammatory disease, 2 cases which underwent operation; endocervicitis with leukorrhea and a tenderness of the uterosacral ligaments in varying degrees, 6 cases. Of these 6 women, one was lost to the writer. Three of the remaining 5 ceased treatment before they approached near a cure, and 3 still complain of symptoms and are kept under observation. Therefore, of 39 women who had stem pessaries inserted in their cervical canal, 2 were subsequently operated upon for pelvic inflammatory disease, while 6 had various degrees of morbidity directed to the cervical glands, or 8 women in all had morbidity from a total of 39.

THE TREATMENT OF PERITONITIS.

BY

GEORGE W. CRILE, M. D., F. A. C. S.,

Cleveland, Ohio.

After exhaustion or shock due to the condition for which an operation is performed; after starvation from cancer or obstruction, hemorrhage from perforating ulcers; or after the physiologic disturbance produced by the operation itself—for instance, resection of the stomach, of the gall-bladder, or of the intestines—the most common danger incident to abdominal operations is infection. In civilian surgery the principal sources of abdominal infection are the appendix, the gall-bladder, the tubes, ulcers, or the operation itself; while in military surgery infection may be due to missiles, clothing, or the contents of the hollow viscera, especially the last.

It follows that a consideration of the methods of prevention and treatment of abdominal infection has a direct bearing upon every type of abdominal operation. The scheme of treatment which we shall present is based upon a total experience, in all types of operations, of my colleagues Dr. F. E. Bunts, Dr. W. E. Lower, Dr. H. G. Sloan, and myself, and includes 13,145 laparotomies, consisting of 6820 for appendicitis, 1261 operations on the stomach and intestines, 1289 gall-bladder operations, and 2837 operations on the female pelvic organs. By the general management to be outlined in this paper, our mortality in all abdominal operations has been decreased 33⅓ per cent.; in acute appendix operations alone the reduction in mortality has been decreased 67.6 per cent.

The presence of infection is readily determined by two characteristic groups of symptoms: general and local. The general symptoms are: accelerated pulse and respiration, increased blood pressure, elevation of temperature, and rapid loss of strength and weight. All indicate the presence of some acid-forming activity. The local symptoms are: pain, tenderness, distention of the abdomen, muscular rigidity, intestinal paresis, and vomiting. These indicate the protective response of the organism to the bacterial invasion; it is nature's effort to secure immobilization to prevent spreading of the infection. This increased activity of the organism in its self-de-

fense against the infection, and the acids formed by the infection, added to those due to chronic disease, lower the resistance of the patient. The prime problem of abdominal infection, therefore, is the same as the prime problem of abdominal surgery in general—the reduced resistance, and mounting acidosis of the patient.

These facts point the way to the two first requisites in treatment: (1) The conservation of the remaining energy in the body against further depletion; and (2) the neutralization and elimination of the superabundant waste products. In an abdominal case, in which immediate operation is not imperative, the vitality of the patient may be increased by obvious measures—diet, fresh air, and, above all, *rest and sleep* until a favorable condition for operation is attained.

In the soldier with perforated intestines, however, and in the starved civilian patient with partial obstruction, or an acute infection, operative measures cannot be postponed. In these cases the administration *per rectum* of a five per cent. solution of soda bicarbonate with five per cent. glucose, and an immediate transfusion of blood, may effect a sufficient restoration of the patient for the operation; or, at least, for the first seance of a two-stage operation under strict anociation—nitrous oxid-oxygen analgesia, local anesthesia, and the minimum amount of manipulation required to complete the operation; or, in grave situations, to make a sufficient anatomic adjustment to save the patient until an interim of rest and restoration have sufficiently increased his vitality to permit the performance of the second and major stage of the operation.

As for the technic of the operation, whether it be performed in one or two stages, for the removal of an appendix or a gall-bladder, resection of the stomach or colon, removal of tumors of the ovaries or uterus, or—in the wounded soldier—the repair of intestinal rents or perforations, every step should be under complete anociation, nitrous oxid-oxygen anesthesia, or analgesia, supplemented by ether only when it is necessary to secure increased relaxation during the exploration, novocain infiltration, gentle manipulations, and sharp dissection.

The essential points in the anociated treatment of abdominal infection, therefore, are the following: (1) Nitrous oxid-oxygen. (2) Anesthetized incision. (3) Accurate, clean cut operation to diminish both infection and shock. (4) Adequate drainage. (5) Fowler's posture. (6) Vast hot packs over the entire abdomen, spreading well down over the sides. (7) Five per cent. sodium bicarbonate, with five per cent. glucose by rectal tap, continued as long as it is tolerated. (8) Primary lavage of the stomach, repeated

only if indicated. (It will rarely be indicated if anociation is complete.) (9) From 2500 to 3000 c.c. of normal saline subcutaneously every 24 hours until the period of danger is past. (10) Morphin hypodermically until the respiratory rate is reduced to 10 or 14 per minute, and held there until the danger is past. It should be remembered, however, that morphin is not useful in a streptococcus peritonitis.

By employing water, hot packs, and morphin the surgeon can play the patient almost at will. The control of the drive, as marked by the changes in the respiratory rate in particular, is dramatic. Morphin lowers the respiratory rate, decreases the peristalsis of the intestines, reduces pain, secures physiologic rest and sleep—the prime means of recuperation.

Under this combination of the anociation of peritonitis, with the anociated operation, my associate, Dr. Lower, and I have performed 409 operations for acute appendicitis, with or without generalized peritonitis between deaths.

DISCUSSION ON THE PAPER OF DR. CRILE.

Dr. Robert T. Morris, New York City.—Mr. President: I agree with all of the points that Dr. Crile has made, but ask a question in regard to his philosophy of the Alonzo Clark treatment. The Alonzo Clark opium treatment is the best single resource I have ever employed in acute spreading peritonitis. Dr. Crile says that he applies this treatment to aid metabolism. That was not quite my philosophy of the treatment. If we get the respirations down to 10 to the minute, peristalsis practically ceases, and the infection is then walled in. That is one point. Second, Dr. Crile has shown that in great pain destructive sensations are being shot into the centers of consciousness of the patient. A patient with acute spreading peritonitis is in great pain. Opium inhibits that dangerous destructive influence. Those are the two chief points in the action of opium.

It is true, as Dr. Crile says, that it is difficult to get the house staff to carry out the method. If I can get the house staff to carry it out, I find the nurse wont carry out the instructions of the house staff because of prejudice against opium. It is almost necessary to stand over the patient with a club in order to have the treatment carried out if you would save life. If we kill two nurses and one member of the house staff you may then save the life of the patient. (Laughter.) You will have to train each house staff and each set of nurses separately to carry out this treatment. Do not use morphin excepting for the initial dose.

Opium acts over a longer period less violently, it causes less dryness of the tissues, less unpleasant reaction, and therefore, opium is the

thing to use, and not morphin, excepting at the very initial dose when the patient is vomiting and in such distress that opium will not take effect promptly. Give morphin enough to head off vomiting and pain, and then let the opium treatments be started and keep it up. Dr. Clark said, "Don't measure the opium; measure only the respiration rate." Don't forget that. If you have an acute spreading peritonitis, don't measure the opium but measure only the respiration rate, and keep the respirations down to about 10 for a few hours. It is perfectly astonishing to see how quickly you will put water on the flames and head off an acute spreading peritonitis by this method alone. The respiration rate stands as an index to the peristalsis rate, and the latter is what we are after. I approve of the treatment suggested by Dr. Crile in addition to the opium treatment of Clark, which is the best single means I have employed in this condition.

Dr. Miles F. Porter, Fort Wayne, Indiana.—I would like to emphasize all the points made by Dr. Crile, except I would rather coincide with Dr. Morris' philosophy as to how it does it. I want to make this suggestion: If opium is a good thing for one reason or another in these cases, why do you wait so long before you give it. We hear lots of these cases of spreading peritonitis reported. You have made an examination, you know what you are going to do; you are going to open the patient's abdomen, and now is the time to give opium, then bring her in and do your work.

Dr. Aaron B. Miller, Syracuse, New York.—Mr. President: Four cases of perforations of the stomach have come under my observation with all the attending symptomatology of the same. The interval between these was so short that I was impressed by the attending conditions and the similarity of the symptoms. Two of the cases occurred in men past the age of fifty (one over sixty); one in a middle-aged lady, one in a young woman. The men lived some distance from my home and were not seen until after twelve or fifteen hours had elapsed. The men had been cared for by the local physician, and had been given morphin freely to relieve the severe pain, both sudden in their onset and demanding early relief from their suffering. The usual 1-4 grain of morphin did not avail. It was repeated in each case until from one grain to two grains had been given during the interval. The usual surgical abdomen was present, and the localized point of tenderness; the other usual physical findings confirmed the diagnosis—pulse full and bounding.

The middle-aged woman had remained from early morning until midday without attention, as her attending physician was engaged with other work and did not respond to the early call. The clinical symptoms and physical findings were all confirmatory of the conditions. In this case the pulse was absent from the wrist, and a very feeble heart action was present.

The young woman was seen early after the perforation. All the cases were operated upon and responded readily, except the woman who was pulseless at the first visit; she had a good physique and should have had more resistance than the other three. My reasoning led me to believe that the three were protected by nerve block

by the morphine, while she remained several hours with intense suffering. Dr. Crile's paper confirms this in my own mind, but "one swallow does not make a summer."

In all our abdominal work, it would be better many times, instead of forcing the organs to do more work, when the patient is in an exhausted state, to give them rest by an anodyne, and the period of rest would bring the desired results, besides many times saving a human life.

Dr. Gordon K. Dickinson, Jersey City, New Jersey.—If Dr. Morris or any other Fellow will put his ear to the abdomen in a case of peritonitis he will find that the intestines are blocked. They are not moving. There is no peristaltic wave. The intestinal tract bears an intimate relation to the lymphatic system, and when it is working it is pumping fluids and toxins absorbed from the intestinal tract right into the system. We do not have violent intestinal action in cases of peritonitis if we have any at all. The action of morphin upon the metabolism is quite certain. I think dehydration is one of the great factors to remember, and not only it, but also the use of morphin. If you give morphin or opium (I give drachm doses of laudanum) and do not control dehydration you will not have recoveries.

Dr. Crile (closing the discussion).—I appreciate very much what has been said by Dr. Morris, Dr. Porter, Dr. Dickinson, and the other gentlemen who have discussed this paper; I want to add a word more about the use of morphin.

During the war we saw constantly the beneficial effects of morphin in large quantities as a preventive of shock. Patients who were so desperately wounded that they were considered inoperable were often given large doses of opium in water that they might die in peace. Sometimes, although apparently moribund, they did not die. As Dr. Morris has pointed out, we have almost forgotten some of the lessons taught by older physicians, in particular that taught by Dr. Alonzo Clark regarding the value of the opium treatment for peritonitis.

A STUDY OF CERTAIN BANDS IN THE RIGHT UPPER ABDOMINAL QUADRANT. ILLUSTRATED BY CASES.

BY

COMMANDER WILLIAM SEAMAN BAINBRIDGE, M. D., M. C., U. S. NAVY, R. F.

New York, N. Y.

(With fourteen illustrations.)

The object of this paper is two-fold: first, to draw attention to some points which have proved of practical value to the writer in operations upon the abdominal viscera; second, to report, in brief, some selected illustrative cases. The drawings shown were made in the rough when the abdomen was open, and the findings were dictated during the operation.

1. The prone position often fails to give the surgeon an exact conception of the conditions present when the abdomen is opened. Early bands and adhesions are often overlooked, or their importance is not realized. The reverse Trendelenberg will be of aid in arriving at an exact diagnosis. This, however, frequently is not sufficient. We must put traction downward on the hollow organs, so as to picture what would be the relations if the erect posture were assumed.

2. It was only after the anatomist placed the body erect, froze it in that position, and made sections, that the exact anatomy of the body cavities and their organs was determined. The roentgenologist early realized that much could be learned by the examination in the upright position. It has been my experience that a few dissections made by the abdominal surgeon, with the body upright, are of great value in preparing him for his work.

3. Many a small band or adhesion, when it is seen in time, and its significance is understood, will, if treated adequately, prevent more serious conditions.

4. "Breaking up of adhesions" is an unfortunate term. In very bad cases that may be all one can do: literally to bear these bands and hope that chance will bring those which inevitably re-form in places where they will not do as much harm as before. Success sometimes follows such a course, but more often failure. By carefully dividing bands transversely and suturing longitudinally, by

flaps of peritoneum or of omentum or skin grafts, a surgeon can cure many a case of distressing adhesions.

5. Early adequate attention to bands and adhesions in the right upper abdominal quadrant often makes such operations as cholecystotomy, cholecystectomy, and gastro-enterestomy unnecessary.

6. May it not be possible that by a just estimate of the mechanics of the abdomen and careful attention to the lessons learned, we may better order our lives from the beginning and so often prevent the formation of bands and adhesions, thus obviating their serious sequelæ?

CASE 1.—A. M, aged thirty-one; female; single. First seen Nov. 29, 1916.

Chief Complaint.—"Bilious" attacks during past two years. At first these came every month, but during the year previous to my seeing the patient, the average was one a week. Attacks consisted of general malaise, headache, nausea, and vomiting of bile with

FIG. 1.—1. Liver. 2. Fundus of gall-bladder. 3. Bands from gall-bladder across duodenum to gastrocolic omentum. Traction on the transverse colon caused these bands to stand out, the gall bladder to be pulled downward, angulating the cystic duct and compressing the duodenum. Practically, the transverse colon was supported by these bands, and the dilatation was proximal to this point. 4. Ascending portion of duodenum distended. 5. Descending portion of duodenum not distended.

slightly yellow tint to conjunctivæ. No pain. Any great exercise in the upright posture brought on an attack. Marked constipation. Practically an invalid; unable to work.

Physical Examination.—Resistance over gall-bladder; tenderness over terminal ileum. Poor general condition.

X-Ray Examination.—Dilated ascending colon with ptosis of hepatic flexure. Colonic stasis chiefly in ascending colon.

Treatment.—Six months of best dietetic, medical, and physico-

therapeutic treatment to avoid operation. Considerable gain in general condition, but attacks persisted.

Operation.—Polyclinic Hospital, New York, June 5, 1917. Laparotomy. Conditions found as shown in drawings I and II. Appendix not diseased, but removed. Bands relieved in usual way by cutting transversely and carefully suturing longitudinally. On examination after bands were corrected pressure on the gall-bladder easily emptied this organ of its contents; no stones were found. Attachment of great omentum to right ovary and tube corrected. All raw surfaces covered.

Subsequent History.—Uneventful recovery. Last report September 2, 1919. Teaching or working continuously since September, 1917. Feels operation has markedly benefited her. Considers herself well. Bowels easily moved by diet.

FIG. 2.—1. Omental band; tip of great omentum attached to right ovary and tube. 2. Ovary. 3. Tube.

CASE II.—A. E., aged twenty-six; male; single. University student. First seen April 6, 1916.

Previous Personal History.—Most of the time for past eight years suffering from hyperchlorhydria. Gastric and abdominal distress with attacks of vomiting and frequent recurrence of symptoms of duodenal ulcer. Marked constipation and loss of flesh. X-ray examination in December, 1914, showed some pyloric stenosis. Received medical treatment with little effect. During this treatment was sent to a farm, and in five months lost forty-nine pounds in weight.

Physical Examination.—Tenderness over terminal ileum and duodenum.

X-ray Examination.—Deformity of cap; marked gastric retention, stomach being only half empty at six hours. Descending and horizontal duodenum dilated, suggesting duodenojejunal kink.

Diagnosis.—Old duodenal ulcer and intestinal toxemia.

Operation.—Polyclinic Hospital, New York, April 29, 1916.

Laparotomy.—Condition found as shown in drawing III.

Gall-bladder adherent to duodenum, with white scar of old duodenal ulcer at base of one of the strong bands. Marked duodenojejunal kink. Cecum dilated. Appendix slightly thickened; removed. Cecum plicated. Bands about gall-bladder cut transversely and raw surfaces covered by interrupted longitudinal sutures.

Note.—The retention in the stomach simulating pyloric stenosis was due to a definite duodenojejunal kink.

Subsequent History.—Uneventful recovery. Considered himself perfectly well and entered Officers' Training Camp at Plattsburg. In the fall of 1917 received a commission in the United States Army and was able to participate actively in the war.

FIG. 3.—1. Gall-bladder. 2. Bands. 3. Dilated second portion duodenum. 4. Site of scar of old ulcer. (Picture shown before Railway Surgeons Association, Pennsylvania Lines East of Pittsburgh at Philadelphia, October, 1916.)

CASE III.—F. W., aged thirty; female; single. First seen August 7, 1915.

Previous Personal History.—Typhoid fever, 1910. Bilious attacks of increasing frequency.

Physical Examination.—Gall-bladder tender. Liver slightly enlarged. General enteroptosis.

Treatment.—Diet, medicine, supporting corset, and special exercises. Treatment was carried on for a year with the exception of two months, when she was placed in reverse Trendelenburg position and given forced feeding and rest regime. Improved, but still complained of attacks of biliousness, with vomiting of bile and gastric discomfort.

X-ray Examination.—General enteroptosis.

Operation.—The Lodge, Chautauqua, New York, July 27, 1916.

Laparotomy.—Conditions found as shown in drawing IV. In addition, marked prolapse of all abdominal viscera; moderate sized

duodenojejunal band, kinking the juncture; well developed ileopelvic band. Appendix underhung and adherent to band. Cecum mobile, rotated inward. Ileocecal valve incompetent. Accentuated last kink. Bands cut transversely and sutured longitudinally. Appendix removed. Cecum plicated and anchored. Raw surfaces covered in usual manner.

Note.—When abdomen was opened and patient was placed in reverse Trendelenburg position, the large intestine became dependent and the band to gall-bladder and stomach stood out very clearly and the kinking of cystic duct was apparent. When "cholecystocolonic" band was bisected, it was very easy to empty distended gall-bladder, which was impossible with reasonable amount of pressure, before release of band.

FIG. 4.—1. Dilated duodenum. 2. Band supporting transverse colon. 3. Band from fundus of gall-bladder across duodenum coalescing with band from edge of gastro-colic omentum supporting transverse colon. 4. Transverse colon.

Subsequent History.—Patient was given general enteroptic corset and careful regime during convalescence. An automobile ride, soon after leaving hospital, caused pain in small of back for a time. This was relieved by refitting with new corset and supporting right kidney. In April, 1917, she was in excellent condition; gained sixteen pounds in weight; had no more bilious attacks. Last report September 7, 1919. Weighs more than she ever did before. Finished two years' work of training for nurse without missing a day. No constipation and no unpleasant symptoms. Feels better than she ever has felt in her life.

CASE IV.—S. D., aged thirty-one; female; married. Referred by Dr. H. W. Schlappi, Fulton, New York. First seen January 12, 1917.

Previous Personal History.—Appendix and right ovary removed and uterus stitched forward six years ago. Acute attack of tonsillitis in spring of 1916, followed by chills and general yellow tint to

skin and conjunctivæ. In November, 1916, she had another attack of chills and vomiting of bile, with discomfort in the right hypochondrium; in bed five weeks. She has general abdominal discomfort and nausea. Walks almost with a hump-back. After *x*-ray examination recently, previous to seeing me, she was told "there were shadows around gall-bladder which were suspicious of gall-bladder trouble."

Physical Examination.—Tenderness over gall-bladder, liver and terminal ileum. General enteroptosis. Right kidney floating. Some secondary anemia. Practically, a chronic, nervous, dyspeptic invalid.

X-ray Examination.—Nothing pathological in or about gall-bladder (this contrary to the diagnosis made by the first roentgenologist); pelvic adhesions with some compression of the terminal ileum.

FIG. 5.—1. Distended gall-bladder. 2. Hepatic flexure. 3. Bands constricting duodenum.

Operation.—Polyclinic Hospital, New York, January 15, 1917.

Laparotomy.—Conditions found as shown in drawing V. Great omentum tightly adherent to scar of previous laparotomy wound, which extended from umbilicus to symphysis. Attachment of great omentum fixed stomach and transverse colon to abdominal wall. This easily explains hump-backed attitude patient assumed when standing, which started soon after previous laparotomy several years ago, and which became more marked of late. Stomach enteroptic. Pylorus normal. Y-shaped band attached to under surface of liver in center of which was gall-bladder, distended, but containing no stones. Band was very strong; its upper attachment consisted of three forks; one to right of gall-bladder, one to gall-bladder, and one to left of gall-bladder. This went almost to gastrohepatic omentum, across transverse colon. Distinct duodenojejunal kink. No adhesions around old appendix stump. Cecum dilated. Peri-

colic bands along cecum and ascending colon. Right tube and ovary absent. Uterus retroverted and retroflexed. Last kind of pelvic colon markedly angulated. Bands and adhesions were treated in the usual manner restoring, as far as possible, normal continuity of hollow viscera. Uterus anchored forward by Johnson-Willis operation. Duodenojejunal band stretched, as it was found unnecessary to bisect it.

Subsequent History.—Convalescence prolonged but uneventful. Last report, July 1919. Old symptoms entirely relieved. Good general condition. Walks perfectly well. Able to do her own work.

CASE V.—A. Z., aged thirty-five; male; married. Referred by Dr. John E. Breglia, New York. First seen March 8, 1917.

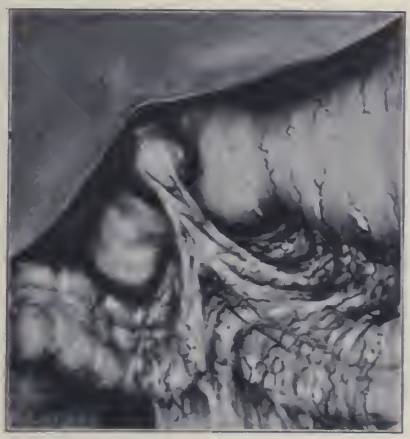


FIG. 6.—1. Gall-bladder. 2. Hepatic flexure. 3. Y-band with two arms downward supporting transverse colon across duodenum by attachment to fundus of gall-bladder. 4. Thickened edge of great omentum.

Previous Personal History.—Recurrent mild attacks of appendicitis with constipation, and at times distress in the right hypochondrium.

Examination.—Tenderness over appendicular region, high placed appendix.

Diagnosis.—Intestinal toxemia with relapsing appendicitis.

Operation.—Polyclinic Hospital, New York, March 9, 1917.

Laparotomy.—Conditions found as shown in drawings VI and VII. Appendix found chronically diseased with some adhesions. Beginning diverticulum of cecum. Distinct constriction of transverse-colon, even in supine posture, a band from gall-bladder, extending from base to fundus, across duodenum to gastro-colic omentum, folding up omentum which was tightly adherent to gall bladder. Appendix removed; cecum plicated; bands freed in usual manner. Raw surfaces turned in.

Note.—This might easily have been taken for a case of mild relapsing appendicitis, and the removal of the appnedix considered

sufficient. The importance of not always accepting the appendix as the cause of all the trouble, and the wisdom of making a careful abdominal examination are clearly demonstrated in this case.

Subsequent History.—Convalescence uneventful. Last report August 4, 1919. Patient looking and feeling perfectly well. The physician who referred the case to me states that the man has not had a sick day since the operation.

Case VI.—H. K., aged twenty-five; female; single. First seen April 10, 1916.

Previous Personal History.—Compelled to give up college work and was drifting toward chronic invalidism. In January, 1914, she had attack of appendicitis. In bed a week; no operation.

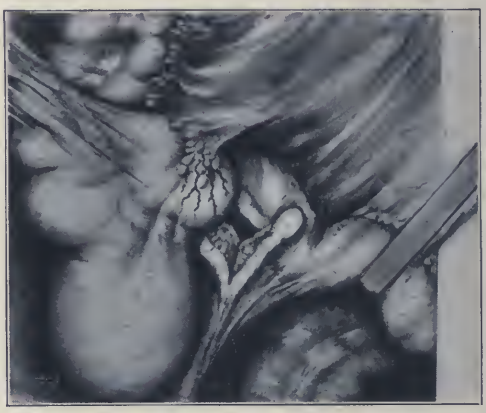


Fig. 7.—1. Pericolic bands, so-called "Jackson membrane," attempting to hold up rotating mobile cecum. 2. Diverticulum of cecum. 3. Ileopelvic band with appendix attached. 4. Pelvic colon. 5. Bulbous end of appendix.

Six weeks later had another attack. On March 18, 1914, had appendix removed and uterus stitched forward. Markedly constipated. Since operation has felt well for only three or four months, and dropped from 137 to 114 pounds in weight. Has abdominal discomfort, especially referable to epigastrium most of time. Frequent eructations of gas. At times nausea and occasional vomiting.

Physical Examination.—Some psoriasis. Lumps in upper and outer quadrant of both breasts. Considerable abdominal gaseous distention. Thoroughly toxic. This was such a marked case of chronic intestinal stasis that *x*-ray examination was deemed an unnecessary expense.

Operation.—Polyclinic Hospital, New York, April 14, 1916. Laparotomy. Conditions found as shown in drawings VIII, IX, X, XI.

Stomach prolapsed so that lesser curvature lay below umbilicus. Pylorus and duodenum greatly dilated. A strong band of adhesions attached above to gall-bladder—from near apex of fundus to gastrohepatic omentum—crossed duodenum and extended over pylorus at one point. Main part of band went downwards to prolapsed

transverse colon. As the patient was lying in prone position on operating table, real significance of band was not apparent until traction of colon was made, simulating conditions in standing posi-

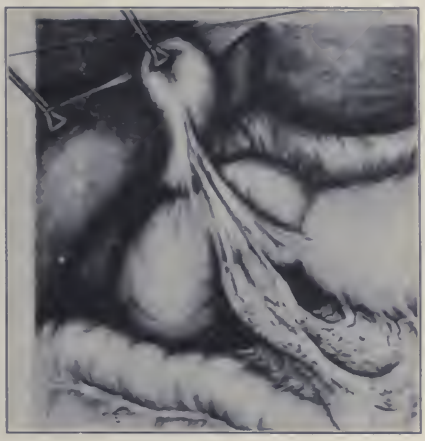


FIG. 8.—1. Gall-bladder. 2. Band at base of gall bladder and along cystic duct across duodenum. 3. Band from liver to cystic duct, tending, with gall bladder in dependent position, to rotate cystic duct. 4. Transverse colon. 5. Band extending across pylorus. (Picture shown before Railway Surgeons Association, Pennsylvania Lines East of Pittsburg, at Philadelphia, October, 1916.)

FIG. 9.—1. Transverse colon held up, exposing region of duodenojejunal obstruction. 1. Transverse colon. 2. Descending colon. 3. Collapsed jejunum. 4. Bands about termination of duodenum. 5. End of dilated duodenum, showing marked distension; effort being made to empty stomach by pressure on gastric organ which markedly dilated duodenum to point of duodenojejunal kink.

tion. Then a marked indenting of duodenum—almost obstruction —by this band from gall bladder to colon, was clearly demonstrated. A very strong band which rotated gut outward and caused consider-

able obstruction, went across ascending colon just below hepatic flexure. Small ileo-pelvic band. Cecum very mobile and greatly enlarged. Sigmoid redundant with accentuated lask kink. Bands treated in usual manner; cecum enfolded. All raw surfaces covered.

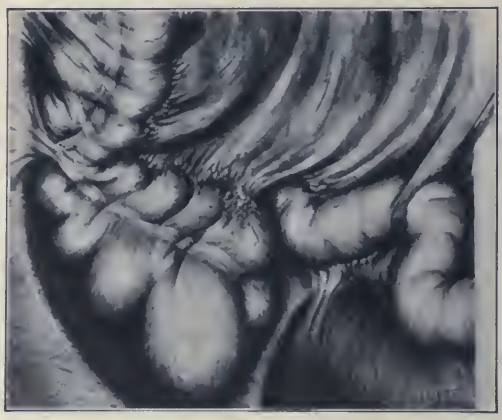


FIG. 10.—1. Small ileopelvic band. 2. Diverticulum. 3. Stump of appendix. 4. Ileopelvic bands. The junction of cecum with ascending colon forms a point of obstruction when mobile cecum tends, when full, to rotate from above downward and from without inward.

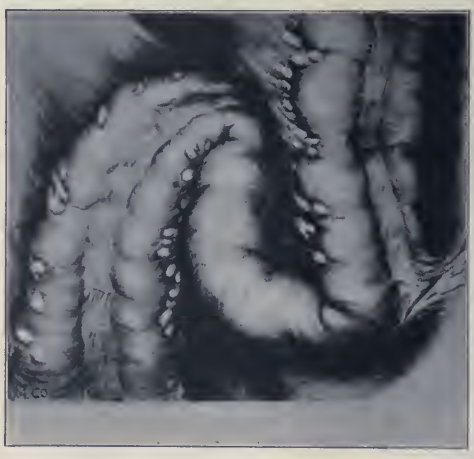


FIG. 11.—1. Pelvic colon. 2. Accentuation of last kink.

Subsequent History.—Convalescence uneventful. Last report July 8, 1919. Perfect condition. Lumps in breast disappeared. Patient states she could not wish for better health.

In the aforementioned cases, many symptoms were referable to the right upper abdominal quadrant, and those consulted had con-

sidered the probability or certainty of the presence of gall stones. None were found, and there seemed no need of removing a gall-bladder which was not, apparently, diseased. All these cases were treated by the least amount of surgical interference which the pathology seemed to demand.

Allow many of these bands to remain and the patient to gain in strength, and the points of obstruction will become more acute, the toxemia continues indefinitely, and the inevitable added pathology often means conditions requiring far more surgery.

The following three cases illustrate this point:

CASE VII.—E. R., aged forty-five; female; single. Referred by Dr. Wm. Van Valzah Hayes, New York City. First seen December 11, 1915.

FIG. 12.—1. Band twisting outlet of gall-bladder. 2. Distended gall-bladder. 3. Hepatic flexure.

Previous Personal History.—Typical of intestinal toxemia with what was called "mild gall stone attacks;" some hemorrhoids.

Physical Examination.—Large, distended gall-bladder, extending practically to umbilicus.

X-ray Examination.—"Large distended cecum with first degree patency of the ileo-cecal valve. The cecum is so dilated that the effort of defection does not empty it."

Operation.—Polyclinic Hospital, New York, December 12, 1916.

Laparotomy.—Conditions found as shown in drawing XII.

Large, distended gall bladder. Angulation of cystic duct near base by strong band across duodenum to gastrocolic omentum. This band not only angulated duct, but rotated gall-bladder and kinked large gut when traction was made on transverse colon, as in upright posture. Gall-bladder removed, no stones. Bands corrected. All raw surfaces covered. Condition of patient was such that it was judged wise to attend only to right upper quadrant.

Pathological Report.—Chronic inflammation of gall sac.

Subsequent History.—In February 1917, after an uneventful convalescence returned to work seemingly perfectly well. Lost sight of at end of 1917, when she was reported by Dr. Hayes as in excellent condition.

CASE VIII.—C. F., aged sixty; female; married. Referred by Dr. C. P. Faller, Carlisle, Pa. First seen April 27, 1917.

Previous Personal History.—For seven years off and on discomfort in right upper abdominal quadrant. Marked constipation. Hemorrhoids. Intestinal toxemia. Typical gall stone attack December, 1916.

FIG. 13.—1. Gall-bladder with seventy-five stones; kinked at base by band over duodenum to region of cystic duct. Band attached to mass of adhesions and situated around fundus of gall-bladder. 2. Mass of adhesions. 3. Fundus of gall-bladder. (The mass of adhesions around the gall-bladder was distinct, although attached to the single band at the base of cystic duct.)

Physical Examination.—Distinct tenderness over gall-bladder and descending duodenum. Some tenderness over ileum and last kink. Anemic.

X-ray Examination.—"Pathological gall-bladder with pericholecystitic adhesions, the probable presence of gall stones, and a tender, partially fixed, stiffened cecum from adhesions which may be the result of a chronic appendicitis."

Operation.—Polyclinic Hospital, New York, May 8, 1917.

Laparotomy.—Conditions found as shown in drawing XIII. Appendix kinked, chronically inflammed and underhung, causing ileal stasis. Great omentum attached to right lateral wall, suspending gut. Gastrocolic omentus near pylorus and lower part of pyloric portion of stomach on greater curvature was attached by a strong band from fundus of gall-bladder across duodenum to transverse colon. An extension downward toward common bile duct of thin white fibers caused angulation at junction of cystic duct with common bile duct, making it difficult for gall-bladder to empty itself

normally. Seventy-five stones of varying sizes found in gall bladder. Before organ was opened four stones were milked back from common bile duct; one large stone had to be broken between fingers. Appendix removed. Bands treated in usual manner. Gall-bladder opened and stones removed. Closure as usual.

Note.—The gall-bladder was not particularly thickened, and the condition of patient was such that it was deemed best only to remove the stones and drain the organ. According to a classification accepted by some, we would consider two types of bands being present in upper quadrant: the smaller, evolutionary; and the mass, inflammatory.

Subsequent History.—Convalescence uneventful. Last report, September 8, 1919. No recurrence of attacks; has gained twenty-two pounds. Marked constipation relieved. In excellent condition.

CASE IX.—A. B., aged forty-seven; female; widow. First seen March 1, 1917.

FIG. 14.—1. Gall-bladder. 2. Mass of adhesions. 3. Scar nodule very suspicious of malignancy. 4. Small section of liver removed with nodules.

Previous Personal History.—Constipation and "indigestion" since child was born twenty-four years ago—supposedly bilious attacks or gall stones. Severe attacks at first came every six months, stopped for a time, and then came on once every two or three years. Jaundice eighteen years ago. Operation for rectal fistula fifteen years ago; drained for a year; cured after second operation. Recently discovered a lump in left breast.

Physical Examination.—Lumpy condition of upper and outer quadrant of breasts, particularly left one. Tenderness over gall-bladder and appendix. Cystocele and rectocele.

X-ray Examination.—Practically negative.

Operation.—Polyclinic Hospital, New York, March 27, 1917.

Laparotomy.—Condition in gall-bladder region as shown in drawing XIV.

When the abdomen was opened, a small nodular mass at edge of liver, close to gall-bladder, was discovered. This was situated where a strong band of adhesions found attachment above, extending over

duodenum down to transverse colon—hepatocolic band. The possibility that this was malignant and the presence of so much needing attention elsewhere in abdominal cavity made operator decide to remove this section of liver for examination after relieving all other pathology, except in righ upper quadrant. Accordingly, section of liver as shown in drawing XIV removed, and iodine gut sutures used to close gap and stop hemorrhage. Other conditions found and corrected: Terminal ileum fixed by ileo-pelvic band. Appendix thickened and under inner margin of dilated cecum. Accentuation of last kink, fastening about two inches of terminal colon to left lateral wall. Upper four inches of ascending colon adherent to corresponding length of first portion of transverse colon. All bands carefully cut and raw surfaces covered in usual way. Appendix removed. Ceco-colonic plication with anchoring of gut.

Pathological Report.—Scar tissue at edge of liver—chronic inflammation, apparently beginning to undergo degenerative changes.

Second Operation.—Polyclinic Hospital, New York, April 13, 1917. Matters attended to at operation March 27, 1917, satisfactory. Great omentum adherent over liver scar and about site where small drainage tube had been employed for few days after previous operation. Omental adhesion relieved and gall-bladder exposed. Many adhesions divided. Duodenum at one point markedly constricted by bands. Released. Gall sac with mass of stones and inflammatory tissue around two calculi, which had ulcerated through gall-bladder, removed *en masse.* Drainage. Closure in usual manner.

Subsequent History.—Convalescence uneventful. Saw patient July 14, 1919. Breasts normal. States she is perfectly well, as far as she knows.

DISCUSSION OF THE PAPER OF DR. BAINBRIDGE.

Dr. Charles A. L. Reed, Cincinnati, Ohio.—Mr. President: I have rarely heard a paper that has so thoroughly coincided with my own views and with my own experience as that which has been presented by Dr. Bainbridge. I have had a great deal of work to do in the right upper quadrant of the abdomen, and have encountered these adhesions to which he refers, and I am ready to confirm from personal experience the accuracy of every observation presented here this afternoon.

There is one point I want to emphasize that was not brought out in the paper, and that is why the adhesions? And in answer to that question I wish to emphasize the further fact that in the cases in which I have encountered adhesions I have found uniformly a coloptosis, enteroptosis, visceroptosis in general, varying in degree, always present, and as a necessary pathologic concomitant of that, I always find extreme engorgement of the mesenteric circulation, of the mesenteric veins. What is the necessary mechanical, physiological, and pathological effect of such a condition? There is a downward traction upon the superior mesenteric vein; the tributary veins are as a consequence essentially in a condition of varicosity;

there is, as a result, a damming back of the efferent circulation of the whole gastrointestinal tract. These cases nearly always present a concomitant or intercurrent colitis, often vacillating, often absent for a time. You find there, in that dammed back venous circulation, an explanation of several things. In the first place, you have adhesions of surfaces covered by exudate from dammed back venous circulation. In the next place, you have glandular hypertrophy with hypersecretion from precisely the same cause. The next thing you find present in these cases is enlargement of the mesenteric lymphatics. So you see there is a lot of associated but sequential pathology in these cases.

What, then, is the pivotal point of treatment? To re-establish the normal condition, so far as adhesions and displacements are concerned. But back of that you take away the traction on the superior mesenteric vein and thus release the static circulation; and when you do that you have gone to the bottom of the problem and have established conditions favorable for a permanent restoration of function. Very much can be done in a conservative way, and here I wish to refer very briefly to postural treatment, both preliminary and subsequent to operation, and sometimes making an operation unnecessary. I call it the "ironing board treatment." I put the patient in the Trendelenburg position. I do this twice a day for a half hour at a time. The object is to utilize gravity coincidently with deep massage of the pelvic organs, temporarily to release this static circulation. When up I have the patient put on a brace which acts as a splint. Once a day the patient gets in the knee chest position and puts half a gallon of alkalinized tepid water into the colon to wash it out. It is unfortunate that we are getting in the habit of looking upon intestinal toxemias as arising exclusively from the inside of the intestines and lose sight of the pathology associated with them. This associated pathology, especially as it relates to adhesions, malpositions, and venous stasis, really comprises the most essential features of the case. I say this because I wish to emphasize the fact that we are using this alkalinized water not merely to wash out the colon and to get rid of possible toxins, but we are doing it for the gymnastics of the thing. We are, so to speak, putting a four pound weight inside of that colon, to force it up and liberate the static venous circulation of the mesenteric system, thus temporarily re-establishing the circulation. When you have done that, you will have brought for the time great relief tending in the direction of recovery. This treatment of itself has been so successful in many instances that I have not found it necessary to operate. In cases in which I have used it, but in which I have found it necessary to operate anyhow, it has served the useful purpose of putting the patient in the best possible condition for operation. I have found it so satisfactory that I have come to adopt it as a routine in all gastroenteroptosic cases.

Dr. Robert T. Morris, New York City.—We need a better collection of data before putting emphasis on the condition that has been described. Are these bands adventitious? Are they the result

of autolysis from antibodies in response to a toxic invitation, followed by organization of plastic lympth-exudate? Why are they there? For all these reasons we must separate at least three classes of cases in order to make a good scientific presentation of the subject.

I described these bands and spoke of them as "cobwebs in the attic of the abdomen," in 1903, in the same year in which Mr. Lane described his kink. My paper was published in the *Medical Record*, and Mr. Lane's, in the London Lancet in the same year, and both of us at that time spoke of the bands as of toxic origin. The reason why I spoke of these adhesion bands as being of toxic origin was because I knew the doudenal region was exerting a selective influence upon toxins. Where we have an ulcer of the duodenum, or a gastric ulcer, it is the result of selective affiinity. It proved to be so microscopically. I knew at that time we were having autolysis exaggerated in response to the collection of new cells at a certain point. That was clear in my mind, and I spoke of these adhesions as being of toxic origin, and called them "cobwebs in the attic."

To what extent are they mechanical and adventitious? Dr. Reed places emphasis upon the dammed circulation. I do not know anything about that, and yet that is apparently an important point. Practically, I do not talk about gallstones to these patients; I talk about cholecystitis, and that is a big enough word, and one that will satisfy the family. If we should find gallstones they are so much velvet. But we do have practically all the symptoms of gallstones as a result of the presence of these adventitious bands or the result of a plastic exudate from toxic influences.

Dr. Gordon K. Dickinson, Jersey City, New Jersey.—I notice we differ because we have different view points. Our education has been different. There is nobody to tell us why we are looking wrongly at things. We differ in our home work. If we were all what we should be, naturalists first, and physicians second, perhaps we would come nearer the truth oftener than we do.

If you will read an article by Harvey in the June issue, 1918, of the *Annals of Surgery*, you will find a paper by a man who is a naturalist, who has studied comparative anatomy, comparative embryology, who has worked the thing up to a certain standpoint, and I think you will be convinced by his arguments, which are embryological, that these bands are embryonal affairs. They are overgrowths of omentum, overgrowths of peritoneal and subperitoneal tissues which through the force of the upright position have taken on a condition which we call pathological. In the paper I am going to read later in the session I want to bring that out and interest you in the fact that this is a physiological perversion. We have more deformities in the abdomen on the right side than in any other part of the body, and by studying deformities and the orthopedics of that position we get a better idea of our treatment.

Dr. Bainbridge (closing the discussion).—I desire to thank the gentlemen for their free discussion of my paper. I did not intend, in this paper, to deal with anything but illustrative cases and a few practical points. The causation of these bands is a debatable ques-

tion and deserving of much study. I have discussed at length this subject before the twenty-third annual meeting of the Western Surgical Association, December 19, 1913, at St. Louis, the paper being afterward printed in the *Boston Medical and Surgical Journal* of February 19, 1914. Still we have for years been talking over this phase of Chronic Intestinal Stasis. Just as malaria was cured before the microscope was developed and the plasmodia were shown to us, so, in a conservative way, we are trying to cure many sufferers with bands before we really can be sure of the full etiology.

SYPHILIS AS A CAUSE OF DELAYED HEALING IN THE NON-INFECTED ABDOMINAL INCISION.

BY

WM. EDGAR DARNALL, A. M., M. D., F. A. C. S.,

Atlantic City, New Jersey.

At the Buffalo meeting of this Association in 1914 our distinguished fellow, Miles F. Porter, discussed the question of delayed healing in the non-infected incision. He, however, confined his discussion exclusively to the epigastric region and sought to show the cause as due to the increased tension of the upper abdomen, or the scantiness of the circulation in these tissues, or to nutritional disturbances of the nerve supply.

There seems to be little or no literature on this subject, although nearly every surgeon of considerable experience has had one or more cases. Morris's article in the Journal of the American Medical Association, June, 1911, quoted by Porter, is about the only reference to the subject. Morris thinks that the occurrence of delayed healing in the upper abdomen is due to trophic or neuro-vascular disturbance in the Zone of Head.

Porter collected personal expressions from a number of surgeons. Some of these attributed the separation of the tissues to soiling of the incision with the contents of the upper bowel or stomach, inasmuch as most of the operations in the upper abdomen are performed on these organs. Others thought blood dyscrasia, malnutrition, and toxemic conditions such as advanced carcinoma might be the cause; but Gerster significantly remarks that "back of all these there must lie biochemical causes as yet unknown to science."

Madelung asks why the discussion of delayed healing should be confined to the upper abdomen, when 82 out of 156 cases occurred in incisions below the umbilicus. Deaver sees no reason why wounds anywhere in the abdomen should not heal, in the absence of infection.

None of these reasons seem to me to answer the question adequately. If it is due in the last analysis, as Bloodgood thirks, to catgut, why does not the same catgut used by the same surgeon in the same way not more often result in failure? As a matter of fact, these cases occur so infrequently that this can hardly be the

reason. The same question may be asked if it is due to faulty technic or to infection; and yet busy surgeons of wide experience in each instance seem to be able to recall only a few cases.

Some have thought that the lack of union is most marked in, or wholly confined to the deeper structures. The question may well be put why a surgeon constantly operating over a period of fifteen or twenty years on hundreds of cases, with a well developed and highly refined technic and employing methods of suturing which succeed and are expected to succeed in perfect incisions in practically all clean cases, should after hundreds of such results suddenly be confronted with an incision which, when the sutures are removed at the usual time, opens to the bottom with no attempt at union of anything, not even the peritoneum, which ought to be sealed together in twenty-four hours, with no evidence whatever of any infection. Why should it occur so rarely, if it is due to faulty technic, or catgut, or neurovascular disturbance, or lack of blood supply, or tension? Certainly these conditions occur so constantly that, if delayed healing is due to them, it ought to be as commonplace as the usual occurrences in abdominal incisions such as stitch abscess, incisional hernia, etc.

In my own experience, which covers an active service of nearly twenty years, I can find but three cases among hundreds of abdominal incisions. This comparative infrequency accords with the experience of most of those discussing the question, and also of those quoted by Porter. No surgeon seems to have had many cases, and yet almost all can point to a few. But if the few cases occurring in the practice of each of us could be collected and studied, the number in the aggregate would be sufficient from which to draw valuable conclusions.

Two of my cases occurred in patients with incisions below the umbilicus and one above. The first, a ward case, was that of a negress on whom I did a sub-total hysterectomy for large fibroids. The case was a perfectly clean one. There was no indication after the operation of any infection of the incision, either locally or constitutionally. We thought she was making a beautiful recovery until the removal, on the tenth day, of the silkworm sutures from the skin. Then the whole wound fell wide open, peritoneum and all, so that one could look with unobstructed view to the bottom of Douglass cul-de-sac. She became infected and died. This case occurred before the discovery of the Wasserman reaction, but the almost universal prevalence of syphilis among the Southern negro at least places her under suspicion.

The second case occurred in 1913 in a husky Italian, on whom I did a cholecystostomy. The incision was made through the right rectus muscle. Five days after the operation the incision showed no healing and no infection, and the intestines were protruding. He was taken to the operating room, sewed up again, and fed actively on iodides, with the result that his incision healed perfectly. In his case, the Wasserman reaction was positive.

The third instance occurred in a patient on whom I did a Wertheim operation for carcinoma of the cervix. The other two cases were strong and robust. This one was of lowered vitality, although the cancer had not progressed extensively. When the skin stitches were removed on the tenth day, the incision presented a straight line of apparently perfect union. There had been absolutely no evidence whatever of infection. A few hours afterward, however, it had all fallen apart, even the peritoneum. Her Wasserman was reported negative, but it was learned that she had conducted for years a number of houses of ill-fame, in a series of cities. Her general facies and appearance with sunken nasal bridge and husk voice would have suggested specific disease if there were no such thing as a Wassermann; and there is no doubt in my mind of the presence of an old specific infection, in spite of the negative Wasserman.

These three cases are not enough for adequate conclusions, but two were definitely syphilitic and the other was probably so. This evidence is enough to suggest syphilis as one of the causes, at least, of delayed healing in the abdominal incisions. If by this report I may be able to stimulate the discussion of your individual experiences and to urge each fellow who may have a few cases to study them from the standpoint of specific syphilitic infection and report the results to this Association, in a year or two enough data may be collated to enable us to conclude what part old syphilitic infection plays in the absolute lack of healing in incisions in which we had every reason to expect better things, perfect results, and primary union.

DISCUSSION ON THE PAPER OF DR. DARNALL

Dr. John W. Keefe, Providence, Rhode Island.—I cannot recall a single case where syphilis was the cause of delay in healing of the wound. I have read of such cases occurring, but it so happens that I have never seen one.

Dr. John Norval Bell, Detroit, Michigan.—I would like to report two cases in which there was delay in the healing of the wound following cesarean section. No effort was made to find out

whether any syphilis in the case was present or not. The wound gaped, and I attributed it to a lack of nutrition.

The other case was one of placenta previa where the woman had bled a good deal beforehand.

Dr. Rufus B. Hall, Cincinnati, Ohio.—I recall one case in my own practice where the wound gaped open from one end to the other. It was reclosed. Then I went into the history of the case for syphilis and found that the woman had had syphilis and had been treated for it two years before, but she had no manifestations whatever of that disease when I operated on her. I closed the wound, gave her antisyphilitic treatment, and the wound united promptly and she made a nice recovey.

Dr. Roland E. Skeel, Cleveland, Ohio.—I recall one case of cesarean section for eclampsia in which there was delay in the healing and the wound gaped open, which might or might not have been due to syphilis, and I have seen three cases in the practice of other men without their being able to determine to what it was due. Two were gall-bladder operations, and one in which the incision was made below the umbilicus. My own case being an eclamptic, it would be unfair to say it was due to syphilis.

Dr. Thomas B. Noble, Indianapolis, Indiana.—I have had two cases of this type. One occurred a number of years ago. This was a case of far advanced cancer of the cervix with cachexia. Ten days after the operation, when the nonabsorbable sutures were removed, the wound fell apart as if made of cheese. The wound was resutured, constitutional measures were instituted, followed by complete union and recovery. This woman died eleven years afterward of carcinoma of the spine.

The second case was that of a syphilitic man on whom I operated for gall-bladder disease. Infection followed the falling apart of the wound, and he died of peritonitis.

We have been for a considerable period taking a blood count, at the time of operation, of all patients we operate on, and have been subjecting them to Wassermanns. A small per cent. in our private practice are showing positive Wassermann reactions, but we have not observed so far, in about three or four per cent. of these cases, that they are slower in the healing of their wounds or are presenting any delay in convalescence.

Dr. John F. Erdmann, New York City.—I congratulate the members of the Association at large in so far as they have seen so few separations or dehiscences of the abdominal wall. I have from one to two cases a year in which the dehiscence of the abdominal wall occurs between the ninth and twelfth day after operation. In the majority of cases this separation of the abdominal wall has occurred in those patients in whom there was marked debilitation. I have now a case of acute pancreatitis on which I operated about two weeks ago in which dehiscence of the abdominal wall occurred, due, I believe, to the action of the pancreatic juice or trypsin.

In our service at the Governeur Hospital and Post-Graduate Hospital, we see from two to three such cases a year that cannot

be explained on any other ground than that of debility. Syphilis has not entered into my cases as a cause whatever.

Dr. Porter.—What has been the result of secondary suture of the wound?

Dr. Erdmann:—Never lost one. Healing takes place promptly. I have used silkworm gut in closing these wounds.

Dr. Miles F. Porter, Fort Wayne, Indiana.—I would like to make one practical point in connection with this subject. Syphilis may be the cause of the trouble or tuberculosis, or possibly some other condition that interferes with the reparative power of the patient. We do not known what it is, but don't we all know this, generally speaking, that we may have delayed union? Now then, why in the name of common sense do we want to take the stitches out in ten days when we know there is no tissue in the abdomen capable of uniting perfectly in ten days. Let us put the stitches in and leave them until the day of delayed union has passed, then the wound will not break open.

Commander William Seaman Bainbridge, New York City.—I expect in a certain proportion of badly static cases a breaking down of the fat and a superficial parting of the wound. In spite of all we can do there are a certain number in which we will find that condition, and a careful bacteriological test of the abdomen in profoundly toxic cases has shown a condition of colonic sepsis. We may have colon bacilli, even though we do not open the intestinal canal, swarming over the surface of the peritoneum. That is an explanation which I feel accounts for some of the breaking down of the abdominal wall.

While I have seen a few cases in which there has been separation of the abdominal wound after operation or delayed healing, the question of syphilis as a factor may have too often escaped me. I believe that colon infection, fatty tissue not accustomed to being in a colon atmosphere or environment, may account for some of these cases mentioned. With a short opening, with thorough swabbing out with iodin, usually these wounds heal rapidly.

Dr. Hugo O. Pantzer, Indianapolis, Indiana.—I have had a case, such as described by the essayist, which was clearly associated, not to say caused, by the advent of an acute recurrence of pernicious anemia of which this patient had suffered in previous attacks through several years. Following a laparotomy on the third day, my wound opened and revealed complete absence below the surface of all plain and chromic sutures. The patient made a good recovery, the wound uniting nicely. This time the sewing was enforced with silk worm ligatures through all layers. Four years later the patient suffered another acute return of her pernicious anemia, but much more severe, from which she died shortly. Within twenty-four hours after its virulent onset she became edematous from head to feet. Her yellow glossy skin bulged everywhere with the subcutaneous fluid. This occurrence was interperted by me to mean deliquesence of all the tissues in her body that had lessened vitality, as is included by remoteness to arterial trunks. The decreased

resistance of the tissue proximal to the abdominal incision at the operation caused, I assume, the increased prevalence in this locality of septic destruction in these parts and also liquified speedily the surgical sutures implated there.

This case, occurring many years ago, has always been in my mind as suggesting rather conclusively that pernicious anemia must be regarded a *septic* disease, originating from some focus of virulent infection within the body, which flares into activity by mete excitation, and in time again settles into quiescence, as is evidenced in the clinical course of this disease.

Dr. Darnall (closing the discussion).—The object of my paper was to bring out this kind of discussion, and I am obliged to the gentlemen for discussing it and bringing up these theories as causes for delayed union. Perhaps each one of the factors mentioned in the discussion may be a cause.

Dr. Bainbridge spoke of cases in which there was sero-pus as a cause for the separation of the wound. The cases I spoke of were perfectly dry. We should analyze the secretions or serum from the open wound and find out if there is a bacterial element in it. What is more important, and what we are carrying out now in our hospital, is to make a Wassermann test on every patient who comes in. I believe by doing this we will find a number of cases that are syphilitic which we did not suspect. It may be there are causes other than syphilis for delayed union. There may be hitherto unexplained biochemical causes back of the whole thing in the physiology of the individual. Thorough, active blood studies, and things of that sort, may in the future be able to tell us more about this matter.

The gentlemen who have spoken are men of great experience. Dr. Erdman sees one or two cases in a year's time. Dr. Bainbridge has never seen a case in practice. Dr. Keefe says he has not seen a case, others have seen one or two such cases, and so on. There is something back of it, and it is a problem that will bear a good deal of real scientific work.

While the discussion was going on, I thought of the possibility of the endocrine organs having an important bearing on the subject. I hope in a year or two to have a little more information on the question.

ABSCESS OF THE LIVER.

BY

JOHN W. KEEFE, M. D., L. L. D., F. A. C. S.,

Providence, Rhode Island.

"Close the door—across the river
He has gone!
With an abscess on his liver
He has gone!
Many years of rainy seasons,
And malaria's countless treasons,
Are among the many reasons
Why he's gone!

"Bind the wasted jaw up lightly—
He has gone!
Close the sunken eyelids tightly—
He has gone!
Chineses gin from Bottle Alley
Could not give him strength to rally—
Lone to wander in Death Valley
He has gone!

"In his best clothes we've arrayed him—
He has gone!
In a wooden box we've laid him—
He has gone!
Bogus Hennessey and sherry
With his system both made merry—
Very hard he fought them—very!
Yet he's gone!"

"Down the hill we tramp once more, friends,
He has gone!
Once again we've seen all o'er, friends,
He has gone!
Let us hope we may endure, or,
At least, our taste be surer—
Let us pray the liquor's purer
Where he's gone!"

By James Stanley Gilbert.

Synopsis of Case.—Acute appendicitis, November 12, 1918; appendectomy, followed by fecal fistula. March 7, 1919, closure of fecal fistula. April 30, transpleural opening of liver abscess.

On November 9, 1918, I saw in consultation a man forty-nine years of age. He was born in Armenia, but had lived in this country fifteen years. A diagnosis of acute appendicitis was made, and operation advised. He refused operation at this time, but later entered a hospital, and was operated upon by another surgeon on November 12, 1918. The appendectomy was followed by a fecal fistula, which was still present when he was discharged from the hospital six weeks later. He was then treated by other physicians until March 5, when he again consulted me for closure of the fecal fistula. I found a scar nine inches long with a discharge of pus and feces from the mid-portion.

March 7, 1919, operation; ether anesthesia. An elliptical incision was made, about the fistulous opening, through the skin, fascia, and peritoneum. Feces in small amounts were seen discharging through a small opening in the cecum, which was adherent to the parietal peritoneum. The bowel was separated from the abdominal wall and the fecal fistula closed with a purse-string suture reinforced by interrupted Lembert linen sutures. The omentum, also adherent to the abdominal wall, was separated, and some large vessels were ligated in this structure. The wound was closed, without drainage with chromic gut in the peritoneum and fascia, and a subcuticular silver wire suture to approximate the skin edges of the wound.

On the second day after the operation, the patient developed a cough which persisted for about one week. On the third day the wound showed evidence of infection. The silver wire suture was removed and the wound was drained to the fascia. The ninth day following the operation, the temperature and pulse were normal, and I thought the case was one of simple intramural infection. Temperature and pulse remained normal until the fifteenth day, when there was a rise in temperature and pulse.

The blood examination on the second day showed: Widal test negative 1 in 40, 1 in 80; red blood corpuscles, 4,200,000; white blood corpuscles, 12,500; hemoglobin, 74 per cent.

Differential count: Polymorphonuclears, 80 per cent.; small lymphocytes, 6 per cent.; large lymphocytes, 8 per cent.; large mononuclears, 6 per cent. Reds are of normal color and size. No malarial parasites. The urine normal.

The patient was restless and complained of pain in the right shoulder. Twenty-fourth day, nausea and vomiting. Complained of headache. Feces appeared in the discharge from the wound. Six weeks after the operation, he has a slight chill, followed by rise in temperature and sweats. The patient had lost a great deal in weight. There was slight icterus. The tongue was dry and brown. The wound continued to discharge feces, and the patient looked extremely ill. The chills and sweats recurred at irregular intervals; the jaundice was slightly increased. There was increased liver dullness, both above and below the normal limits of that organ.

Diagnosis.—Abscess of liver. April 30, an incision was made between the tenth and eleventh ribs in the midaxillary line, under local anesthesia with the aid of a 2 per cent. solution of novocain. The pleural cavity was entered and about four ounces of slightly turbid serum was evacuated. The lung was not adherent to the upper surface of the diaphragm. The latter was incised and the peritoneal cavity entered, exposing the liver, which was not adherent to the parietal peritoneum. The capsule of the liver was then incised, and a blunt-pointed clamp was inserted into the liver. About one inch from the surface of the liver, an abscess cavity was entered. The clamp was opened and withdrawn, leaving an opening in the liver through which a finger was passed and the cavity explored. It was impossible to reach all the boundaries of the abscess cavity. About sixteen ounces of thick creamy pus was evacuated. There was scarcely any hemorrhage during the operation. An iodoform gauze drain was placed in the abscess cavity. This was removed on the next day, and the wound irrigated with normal salt solution. The wound drained moderately, but the patient gradually failed, and died five days after the operation.

Abscess of the liver has been defined as a collection of pus involving the tissues of the liver. It may be suprahepatic, intrahepatic, or subhepatic in origin. In the suprahepatic variety, the pus is situated between the layers of the coronary ligament of the liver. The latter ligament, at the posterio superior aspect of the liver, is formed by reflections of the peritoneum of the greater and lesser sac; they are here separated by a considerable interval. The boundaries are the diaphragm above, and the liver below, which is devoid of its peritoneal covering at this point. This area is occupied by the inferior vena cava, lymphatics, blood vessels, and areolar tissue. As an abscess in this region increases in size, the liver is pushed downward, and the diaphragm upward. The liver tissue forms the lower boundary of the abscess cavity.

The symptoms are: diminished movement of the right lower thoracic region, rise in temperature, cough, chills, sweats, and pain; the liver dullness is found higher than normal; symptoms of pulmonary disease at the base of the lung can be detected; the abscess may perforate the diaphragm, the adherent lung, and empty into a bronchus, allowing expectoration of pus.

The suprahepatic abscess, usually, occurs independently of dysentery. The pus is sterile, and contains no ameba coli. An abscess of this type may develop in from ten days to a few weeks or months following a residence in the tropics, without the patient's having suffered from malaria or dysentery.

Intrahepatic abscess is due to dysentery. Pus develops in the substance of the liver, in warm climates especially. An ulcerated area in the colon may be the starting point for pylephlebitis. An embolus, carried from here through the portal vein, may lodge in the liver forming the focus of an abscess. Intrahepatic abscesses, single or multiple, are usually the result of dysentery. The abscess is almost always deep-seated in the beginning, and the pus contains

bacteria. The abscess usually points in the epigastrium, or toward the right lower thoracic region in the midaxillary line.

Subhepatic Abscess.—The pus collects between the lower part of the liver and peritoneum. There may be no pain, but simply a feeling of weight and discomfort in the hepatic region. While the temperature is higher than normal in the early stages of hepatic abscess, later we may have a normal temperature for weeks. Night sweats and progressive loss of weight are constant symptoms. When the abscess reaches the surface of the liver, we have a perihepatitis with pain, cough, and fever.

Deep-seated pus in the liver cannot be diagnosticated with certainty by any single sign or symptom. While this form of liver abscess is most frequently found in the tropics, it is, occasionally, met with in temperate zones, because of the variety of diseases that may enter into its etiology.

Abscess of the liver is always the consequence of infection. The common causative organisms are the staphylococci and streptococci, entameba histolytica, bacillus coli communis, bacillus typhosus, bacillus dysenteriæ, bacillus pyocyaneous, diplococcus pneumoniæ, proteus vulgaris, actinomyces bovis, and others. The infecting agents may reach the liver directly, as when, in consequence of traumatism, bacteria are introduced directly into the liver. Infection may be carried by the blood stream, through the portal vein, hepatic artery, and hepatic veins. Without doubt, this is the usual route of entrance of the infective organisms, although they may gain access to the liver by way of the lymphatics. We may have extension of disease of adjacent organs; namely, the gall-bladder. Ulcerative endocarditis may be the primary cause. Appendicitis may be the forerunner of liver abscess, the infection then taking place through the circulation, following thrombophlebitis or retrocecal extension.

By far the most frequent cause of abscess of the liver is dysentery, especially amebic dysentery. This form may be accompanied by pylephlebitis. It is apt to be found in subjects fond of alcohol, especially gin, and those who lead an irregular life, with exposure to the elements, poorly housed and poorly fed.

The symptoms of suppurative hepatitis vary with the nature and seat of the antecedent disorder, the pathway of infection, and the nature and virulence of the infectious agent. The first suggestion we may have of pus in the liver may be pain in the region of the liver, the pain at times radiating to the right shoulder and below the acromian process of the scapula. However, a large abscess may occupy the liver, unattended by pain. The liver is enlarged in about 16 per cent. of the cases reported; and, in some instances

there has been bulging beneath the ribs anteriorly. There may be tenderness on pressure over the liver.

The facial aspect is sometimes referred to as hepatic facies. The patient is obviously sick; the countenance shows anxiety, distress, and suffering; the complexion is sallow, because of the slight icterus; the tongue is dry and brown; the skin is now hot and dry, now cold and moist; there is progressive loss of flesh. The temperature is irregular, with morning remission, evening exacerbation; recurring chills and sweats; leukocytosis; all of them are among the symptoms noted. A decline of the upper limit of hepatic dullness, near the vertebræ, is said to be characteristic of liver abscess.

Multiple abscesses of the liver of pyemic origin and suppurative pylephlebitis are practically always fatal. The traumatic abscesses, those following dysentery, appendicitis, and those due to extension from a purulent gall-bladder, may be amenable to surgical intervention. Emetin hydrochloride or hydrobromide $\frac{1}{2}$ to $\frac{1}{3}$ grains administered subcutaneously is of value when the ameba histolytics are found.

Occasionally perforation of the diaphragm and rupture into an adherent lung and bronchus take place; and of these cases, about 75 per cent. are said to have recovered. Forcheimer states that diagnostic puncture of the liver should be practised on suspicion of the presence of a liver abscess; and states further that it is a harmless procedure when properly carried out. Manson, Cantile, and others of large experience recommend the use of a trocar and canula to detect and evacuate an abscess of the liver, although Cantile says that patients have died of hemorrhage following aspiration of the liver. Several years ago, I saw in consultation with the most eminent surgeon of our state and the professor of medicine at Harvard, a woman who had irregular chills and sweats with a varying rise in temperature. She had pain at times beneath the left scapula, again in the foot, now in the region of the liver. The lungs were said to be normal as far as percussion and auscultation could inform us.

One day, the surgeon in attendance asked me to see the patient again with him, as he proposed to pass an aspirating needle into the liver, as he suspected the patient was suffering from a liver abscess, and wished to know what I thought about the procedure. I told him I should hesitate to puncture the liver with an aspirating needle, on account of the great vascularity of the organ; and the likelihood of hemorrhage. The surgeon insisted that there was no risk to the patient, and introduced an aspirating needle into the liver, in two different directions, withdrawing only a small quantity of blood.

The patient died during the following night. On the next day, I performed an autopsy. Upon opening the peritoneal cavity, we found it filled with blood, which undoubtedly came from the two punctures into the liver. Examining the heart, we found an ulcer in the left ventricle. The patient would have died, in all probability, from ulcerative endocarditis; but, nevertheless, she died of hemorrhage, following diagnostic puncture of the liver. This sad experience made such a profound impression upon me that I will never countenance aspiration of the liver.

An aspirating needle or a trocar and canula are dangerous instruments to use in the abdominal cavity, regardless of how useful they may be in other parts of the body. Not many years ago, the aspirator needle was used to determine the presence of pus in the pelvis, while now an incision is carefully made through the vault of the vagina into Douglas' pouch. The aspirator was used even to determine the presence of an appendiceal abscess. The needle was left in place as a guide to the surgeon, in making an incision to drain the abscess. Some years ago, I was operated upon in this manner for an appendiceal abscess, and am the living proof that the exception proves the rule.

The first case of appendiceal abscess upon which I operated was first aspirated and then incised and drained. Strange to say, the patient survived the ordeal. No one to-day would think of repeating this method of operating in a case of appendicitis; nor should it be done in abscess of the liver. If one has a definite knowledge of the anatomy involved, he should not hesitate to operate by an incision large enough to give ample inspection of the parts as the operation progresses.

After the capsule of the liver has been incised, a blunt-pointed artery clamp may be pushed into the liver at the site of the suspected abscess. The blunt instrument will push aside instead of injuring the arteries or veins in the liver. I quote Dr. George F. Johnson, who says: "Surgical treatment of abscess of the liver must be prompt, and bold and radical; no measure will succeed which does not completely evacuate the abscess cavity and allow free drainage. This can be done with precision and safety only by incision; aspiration, puncture with trocar, direct puncture with scalpel, opening by caustics, or the thermo-cautery are uncertain, inefficient, dangerous and unsurgical, and are mentioned only to be condemned." These statements I fully endorse.

The aspirator and trocar are employed by timid men laboring under a false sense of security; they feel, because they cannot

see the damage wrought by these instruments, that they are harmless.

The probable location of the abscess must determine the point of attack. An anterior incision may be the most desirable in certain cases; but an incision in the eleventh interspace, mid-axillary line, is the one of choice in the large percentage of cases. The pleural cavity and diaphragm must be traversed before the liver is reached. The capsule of the liver should be incised and a blunt-point clamp inserted through the liver substance into the abscess cavity; the clamp should then be opened and withdrawn in this position, thus enlarging the original point of entrance.

We should be on the alert to detect an abscess of the liver, not only in cases of dysentery, but in several other abdominal infections. We should avoid the use of the trocar, canula, and aspirating needle, because they have been known to cause death from hemorrhage.

DISCUSSION ON THE PAPER OF DR. KEEFE.

Dr. George W. Crile, Cleveland, Ohio.—Mr. President: There is very little I want to say in discussion except to approve all that I have heard. I think the points the essayist has made are sound surgically, and there is very little that can be added.

I heartily endorse what he has said about the use of the aspirator and trocar in searching for abscess of the liver.

The essayist has said nothing concerning the difficulties of handling liver tissue with which I cannot agree. A wounded liver has a great tendency to bleed persistently, and what he has said in that regard confirms our experience in war.

There is one point I should like to discuss regarding cases of multiple abscesses of the liver and pylephlebitis. Years ago when I tried to lay these abscesses open, I saw at autopsy how futile was the operation, and, therefore, I stopped operating for multiple abscesses in pylephlebitis. It happened at about that time that a patient with multiple abscesses and pylephlebitis refused to be operated on, and after a period of two or three months recovered without operation. Since that time I put these patients on the same dietetic and hygienic treatment as for tuberculosis or for chronic infections, and it has been surprising to find how, by supplying these patients with energy and food to be used in building up their own defense, they will recover in three or four months without operation. We put these patients on a balcony, treat them out of doors by forced feeding, and sustain them as much as possible by putting on hot packs over the liver just as we would treat any local disease.

We used a like treatment in certain war cases in which the liver was wounded, and infected, and abscess developed. First we dealt with these cases surgically as far as possible, thus doing all that could be done mechanically. Then we gave them the dietetic and

hygienic treatment, of which I have also spoken. Finally, we superimposed upon that a plan worked not by some of our American units in France, especially by the first Harvard unit under Colonel Hugh Cabot; *i.e.*, we gave a transfusion of blood.

There comes a time in these cases when the patient's life stands in the balance; he is not getting any better or worse, or his condition may be fluctuating. If in such a case a transfusion of blood is given, in a few days the patient will show the following change: he will sleep better; he will be less restless; his appetite will be improved, and as he takes more food, he will begin to gain in strength and to increase his reserve of vitality. This improvement will usually last about ten days or two weeks, and then, unless the patient has overcome the infection in the meantime, he is given a second transfusion. It has been found, as a matter of fact, that it is not best to give too much blood at one time, but rather to repeat the transfusion. This treatment applies not only to infections of the liver, but to infections in any other part of the body as well. There is no question about the additional benefit which is conferred by transfusion, and a Canadian surgeon expressed it nicely and very graphically when he said, "It puts the patient's leg over the stile, and he does the rest himself."

Dr. Hugo O. Pantzer, Indianapolis, Indiana.—I stand before you as one who has been the victim of a malaria which has resulted in abscess of the liver. I came to Indiana forty years ago when in that state the plasmodium malariæ challenged every individual to mortal combat. I battled with an attack of bilious fever for several weeks, and recovered, but with a loss of approximately forty-five pounds. This loss in weight, and its accompaniment of loss of vigor, prevailed for upwards of twenty years. Stupidly enough I went without treatment, as the ravages of the disease were not absolutely disabling, and because, by present course, the individual in our communal life is not held to strict accountment of his physical condition by periodical medical examinations. This measure, however imperative by *various vital* interests, be it parenthetically stated, should be made the function of the modern state.—I dragged along until one day I was found unconscious in bed with a temperature of 104°. When I came to myself, I remember vividly, I had the sensation of a flood of fire streaming down the right half of my abdomen, fiercely painful, necessitating shallow and frequent breathing to the number of 70 to 80 respirations in the minute. It was evident an abscess of the liver had broken, in subphrenic location, and a well developed perihepatitis prevailed. From this my liver became closely adhered to may diaphragm, and as such ever since has impeded my activities as an "athlete." Otherwise I made a good and full recovery, as you might note. The case is cited as presenting characteristically the insidious and slow development of the disease, hardly manifesting itself clinically before the stage of critical issue was at hand.

Dr. Frederick S. Wetherell, Syracuse, New York (by invitation).—Dr. Keefe calls our attention to the danger of the use of the

trocar and cannula in the abdomen. With your permission, I will cite a case which also emphasizes the danger in the use of the same instrument in the chest cavity. While in the service, at the base Hospital at Camp Upton, it was my privilege to see a case of liver abscess due to traumatism. The case, one of empyema, was operated by the surgeon in charge of the empyema ward at that time, he following the closed method, so-called, of empyema drainage. The trocar was inserted rather low in the right chest, and upon entering the chest wall took a sudden jump through the wall down to the shoulder of the instrument. The cannula was then withdrawn partially and pus (afterwards found to be of mixed infection) evacuated. Nothing out of the way was noticed until the next day, when the patient began to run an intense septic temperature. A free intercostal incision was then made. The patient grew progressively worse and succumbed in about four days. Autopsy showed a large empyema cavity in the chest, and a number of liver abscesses clustered about a primary focus, coinciding with the point of a puncture wound of the liver opposite another puncture wound in the diaphragm. I wish simply to bring out in this discussion that, contrary to the popular belief, a thoracentesis may be a dangerous procedure.

TREATMENT OF GUNSHOT WOUNDS OF THE ABDOMEN.

BY

JOHN D. S. DAVIS, M. D.,

Birmingham, Alabama.

In a short paper it is not possible to go into the literature, to give extensive tables on the subject, or to describe operative procedures on the abdominal viscera.

In the year 1896, Dr. W. E. Parker, of New Orleans, read before the S. S. & G. Assoc. in Nashville, a paper on gunshot wounds of the abdomen the most important feature of which was non-drainage. At that time it was common to drain almost every abdominal case, and his teaching was revolutionary. Of course, in injuries of the liver, kidney, pancreas, spleen, and bladder, drainage is indicated; but rarely in injuries of the hollow viscera. Dr. Parker divided the time for operations into three periods: a primary operation, within the first seven hours; a secondary operation between seven and fourteen hours; and a delayed operation after fourteen hours.

I have operated on ninety-seven cases from 1894 to 1916. I have done no operation for gunshot wounds of the abdomen during the past five years. As my assistants have performed all the operations at the Hillman Hospital, I have had no case at my private infirmary during this time. But I have operated on three pregnant women, with perforations, and saved them all. One case, aged twenty-three, pregnant three months, was brought into the hospital twelve hours after receiving the gunshot injury of the abdomen. She had to be transported several miles to a railroad station, and was then brought eighty-five miles to Birmingham on a freight train. Twenty-one perforations of the hollow viscera were found. Sixty inches of the ileum was resected, and two perforations through the mesenteric border of the transverse colon were closed. The patient recovered, and gave birth to a healthy baby at term.

I have not seen great shock in an abdominal gunshot wound that was not due to loss of blood. As a rule, without hemorrhage, the cases appear quite comfortable. A few of my cases walked from one to four miles after being shot.

It is important to establish, as accurately as possible, whether the missile has really entered the abdominal cavity; and, if so, what viscera have been injured. This should be determined without delay. It is better to explore an uninjured abdomen occasionally, than fail to operate on one with perforations. Many wounds, which appear at first sight to involve the abdominal cavity, are only wounds of the abdominal wall; while many apparently insignificant wounds do involve the abdominal viscera. It is difficult to lay down definite rules for action in these cases; but with experience comes a judgment that is pretty reliable. In a large majority of the cases, it is better to operate early rather than waste time in making a diagnosis. The important thing to determine is whether the abdomen should be opened. To await definite indications of a perforation of a hollow viscus, or injury of some solid organ, is to make useless delay. While the point of entrance and the location of the missile (shown by the *x*-ray) will often give valuable information as to its course, they cannot always be relied upon.

The chest type of gunshot wound often causes rigidity of the abdominal muscles, and leads to marked suspicion of abdominal injury. It is very helpful to have the aid of the radiograph in this class of cases. I remember that a physician who was shot in the right chest had marked rigidity of the abdominal muscles on the right side. It was twenty-four hours after his injury; he had been prepared for an abdominal exploration when I saw him; but instead of proceeding to operate, I advised an *x*-ray examination. The bullet was found under the right scapula. In many cases of gunshot wounds of the chest, the patient will present symptoms of abdominal penetration—abdominal rigidity, distention, and hiccup.

There is little to be said about the technic. Little advancement has been made within the past few years. The mortality of gunshot wounds of the abdomen was extremely high during the first years of my experience. This was due, I think, to flushing and drainage. In recent years I have been in the habit of making a toilet by means of dry sponges; and, when drainage is necessary, I use the gauze cigarette covered with rubber, or a small roll of rubber. The abdominal wall is closed by catgut tier sutures, when possible.

Of the ninety-seven cases of gunshot perforations of the abdomen I have treated, sixty cases were operated on within seven hours; twenty-five, within fourteen hours; twelve, after fourteen hours. Five of the last twelve cases were operated on after twenty-four hours; and one, after seventy-two hours. Of these ninety-seven cases, sixty recovered—61.8 plus per cent. Of the sixty cases

operated on within seven hours, forty-eight recovered,—80 per cent.; of the twenty-five cases operated on between seven and fourteen hours, nine recovered—36 per cent.; of the twelve cases operated on after fourteen hours, three recovered—25 per cent. Of the last twelve cases, five were operated on after twenty-four hours, two recovered. One of the two who recovered was operated on after seventy-two hours. He was shot through the ileum with a 32 caliber bullet. There were seven cases of liver injuries—three recovered; two injuries of the spleen—both recovered. In ten, the kidney was hurt—six recovered; in two of the latter, the kidney was extirpated. There were ten bladder cases—seven recovered; and in two, the pancreas was the site of greatest injuries—both recovered. There were seven injuries of the spinal cord, all had perforations of the bowel. One recovered, after closing five perforations, and a laminectomy for the removal of the bullet. This boy (twelve years of age) was able to walk after two years, but his movement was unsteady.

THE MYENTERIC NERVE NET. A DISCUSSION.

BY

GORDON K. DICKINSON, M. D.,

Jersey City, N. J.

GUTS.

By A. W. Burgess.

There's an attribute that makes great fighters win;
Makes them lick their blood-flecked lips, and force a grin;
Makes them, fainting, hold their grip,
And, when losing, smash and rip,
Till again as master-men they wield the whip.

It's the guts:
Wonderous things that lift all winners from their ruts.
If you have them, well and good,
Every able male man should,
For you're not a man at all without you've guts.
If you lack them, well, that's surely mighty tough,
For you'll have to push a momumental bluff
That you have the precious guts,
Or you'll join the horde of muts,
For you cannot be a winner without guts.

On the football field, or in the front-line trench,
Every place where men must strive, and never blench,
Just one thing success demands,
Just one thing puts through commands,
One priceless thing, for on it victory stands.

When our bull-dogs of the sea seek out the foe,
You will hear them gaily singing as they go,
There's a reason for their mirth,
And that reason rules the earth,
For without it nothing worthy could have birth.

So the changeless record stands where brave men meet,
Where earth's haughty spirits trample on defeat—
Pain may madden, reason flee,
Yet a man a man will be,
Till Death, angered, sets his soul from anguish free.

From biological studies it must be inferred that all reason for life—vegetable, animal and human—is to continue the species, and that man's superior brain and body are to better protect the germ plasm as well as for social life, the pleasure of work and the joy of mental effort. We worship the mind and its products; and, outwardly, suppress the instincts begotten by nature. We might be deprived of all but the essentials: circulation, digestion and reproduction; and yet maintain the race as do the lower animals. Man lives but to propagate.

These primitive essentials, all important for life and its perpetuation, are carefully secluded and separated from the outward man, which is under the control of a willful and highly developed nervous system, such intercommunication as exists being entirely beyond the control of the mind. The actions and functions of these three sets of organs are largely autonomic, and in the history of all time it is noted they are the oldest.

The biology of the kinetic systems of the heart and genitalia have been well stated, but not that of the enteric.

About the end of the second week after fecundation, the first evidence of the stomach is found, the development of the gut following out a definite plan of evolution. As in early life we have the stomach without the intestines, so in early fetal life we have the stomach first, then from it extends progressively the gut tube down to meet the hind gut. It has been evolving since the beginning of life and has felt the influence of conditions which tend to modify as well as create, so that the digestive apparatus, as a result of evolution, is the simplest and most perfect, the tissues entering into its structures being still primitive. Evolution invariably develops simplicity of structure and function in the end, and in this instance there is no exception, but a wonderful demonstration of the relation of simple tissue to the essential needs of a highly developed animal.

In the 10 mm. embryo the circular muscular layer of the gut is first demonstrated, the longitudinal layer appearing in the 75 mm. Between these two layers from the mesenchyme are developed a syncytium out of which further develops the intestinal tract. On the inner side can be seen the spindle cell muscle going to the circular layer, and on the outer side similar cells going to the longitudinal layer. In this mesenchyme develop all the other tissues which go to form the structures of the intestinal wall: blood vessels, lymphatics, fibrous tissues and nerve net.

Early in embryonal life there bud out, ventrally, from the spinal

ganglia prolongations which become the sympathetic plexus. From it, cells migrate further inwards to the intestinal tract to enter its structure. From the hind brain, the gut being close to it in early life, there wanders a nerve which also passes to the intestine and through its walls, terminating in numerous gray ganglia approximated to the longitudinal layer. Because of the wanderings of this nerve structure it is later called the vagus.

As the gut grows from above downward, it passes by an accumulation of non-striated fibers, which eventually go to the skin and subdermal tissues. Part of this dermal muscular mass is picked up by the intestine and carried down with it, later to be found at the three sphincter points: pylorus, ileocecal and internal anus.

We have a third type of muscular tissue developed in the intestinal tract. To understand it, we must go back again to biology. In the nine months in which the egg grows into the mature child all the changes and steps which life has undergone in eons of years are recapitulated. Morphologically and histologically we see in the developing fetus much that can be found in the lower forms of life, and by studying low life we often come to a better understanding of conditions in the human.

In the sponge we have evidence of muscular action. The microscope discovers no nerve tissue, but a muscle cell which is neuromuscular, having the properties of irritability, contractility and conductibility. It will receive an impression, contract, and call upon neighboring muscular tissue also to contract. In forms higher up, such as the anemone and star-fish, we find end organs which receive impressions and filaments looking like nerves running to the muscular cell. Somewhat higher in the scale we find ganglia, so that we have a nerve ganglion connected with muscle and more efficient action. This type of nerve is called neuroid.

From the processes of development and microscopical demonstrations one would judge that the neuroid fibers developed from the muscular. Certainly with this type of muscular tissue there is a great deal in common. Keith has discovered in the intestinal tract this primitive type of neuro-muscle, particularly noticeable at points of polarization: the cardiac end of the stomach, pylorus, ileocecal region and large gut. This neuromuscular tissue is difficult to differentiate from nerve tissue.

Through the entire intestinal tract, from the beginning of the smooth fiber muscles in the esophagus to the rectum we find a definite close mesh of what has been called nervous tissue, discovered by Auerbach and named for him. It is slender, flattened, covered by

endothelial membrane and connected with the ganglia which are the termination of the pneumogastric and the terminal filaments of the sympathetic. It is also connected with the neuromuscular tissue of Keith.

The deductions of Keith's work are that this plexus, or nerve net, is really a modified muscular tissue, a syncytium retaining its connections from early embryonal life, that it developed in the mesenchyme and from the mesenchyme, that it did not migrate in with the sympathetic, nor with the pneumogastric, and that it differs from other nerve tissue histologically, chemically, embryologically, biologically, and in innervation and staining properties.

It is very analogous, if not similar, to the nerve net of the heart, which is connected with and activated by the syno-auricular node and the bundle of Hiss, which we know stimulate the heart action through the Purkinje fibers.

It can be seen that in the intestinal tract we have developed conditions which will permit of slow and conservative adjustment to the vegetative processes demanded of it, that we have three types of muscular tissue which are serving a different purpose, three types of nerve tissue, all coördinating and coöperating, yet independent.

The physiology of the gut is that of its component parts. We have, as stated before, three types of smooth muscular cells in the body, and chemically and embryologically we note the difference. In the skin, in the structures which have developed from the Woelffian body and the duct of Mueller, and in the sphincters of the gut we have the dermal type; in the remainder of the intestine, in the heart, and in the spleen, the second type; and in the neuromuscular tissue of Keith, the third. All of these have different biological properties and physiological actions.

All cell activity is maintained by the electrolites circulating in the blood. The sodium in particular has the property of developing electrical forces, especially in the type of muscle cell we have under consideration. The calcium electrolite controls the effect of the sodium salt, if too active. The several muscle cells react differently to this physico-chemical process, and all tissue of this type is constantly contracting and relaxing as a result of this stimulation. It is termed embryonal, because early in embryonal life, before there is any nerve tissue formed, the primitive muscle cells are contracting and relaxing. This is seen in the cardiac tube and in the primitive stomach, and biologically we find the same conditions existing in lower forms of life.

As the content of the stomach, acid in reaction, passes into the

duodenum and meets with an alkaline fluid it effervesces and becomes frothy. This increases the amount of distension and acts as an irritant to the muscle cell. Myogenic contractions occur, contractions which are independent even of the nerve net. They are slow, not forceful and do not produce marked anemia of the substance. There is then gentle relaxation, this process repeating until apparently fatigue of muscle ensues, then stopping, to be taken up elsewhere in the intestinal tract. This is the rhythmic movement of the physiologist.

If the distension be greater, the nerve net is called into action and we have initiated the peristaltic wave, first noted by Cannon and best explained by Sherrington. In the body, when the flexor muscle is called upon for action, there is an inhibitory effect thrown upon the extensor in order that the flexor may act. This is also true in the intestine. If a contraction is to be instituted in any part, induced by the net, as the flow of nerve energy is always peripheral towards the anus, there will be a relaxation of the muscles distal to the point of contraction, thus enabling the intestinal content to be more easily pushed forward.

There are times when not only the circular but the longitudinal fibers are brought into action. This produces a peculiar motion which is termed the pendulum. The neuromuscular cells are pace makers and tonus givers. Contractility is not their only function. They serve better to transform nerve energy into muscle action at certain points. The tonus just distal to each point of polarization in this type of muscle cell is always increased. Irritability and contractility are greater. Peristaltic waves are more pronounced. A section removed from the duodenum or upper ileum shortens itself and curls over on the edges more than a section taken further down. Placed in proper fluid it will retain its rhythmic contractions much longer.

In the upper intestinal tract it is a wise provision, because there the enzymes being abundant and imperfectly mixed proper digestion and chemical changes cannot occur. The tonus is poor in the lower part of the intestine that there may be delay and sufficient absorption of the chyme before passing over into the large gut.

The tonus of the large intestine is produced by the polarization of the terminal ileum. In all animals, particularly those who eat vegetables the cecum has a direct ratio to the stomach in importance. It is here and in the colon that we have instituted absorption of fluids which control dehydration and calcium metabolism. The appendix as well as the cecum is highly provided with nerve net, the pneumo-

gastric ganglia and smooth muscle fibers, controverting in this the prevailing sentiment that the appendix is degenerating.

The sphincter muscles are a law unto themselves. The pneumogastric has no effect whatever upon them. Irritation of the sympathetic causes their contraction, and the only thing which will open the sphincter is the passing down of a proper peristaltic wave.

The sympathetic system inhibits the activities of the intestine with the exception of the sphincters. When irritated, out of the chromaffin bodies we have secreted adrenalin, the hormone of the sympathetic, and all activity of the intestinal tract is quieted. It becomes flaccid, its tone is diminished, and there is distension of its lumen from its gassy content. This may be for a period of rest, or it may develop a pathology when long continued.

The vagus is the motor nerve of the gut. Biologically and physiologically it is a nerve of wondrous action, connecting up the different vegetative viscera, keeping up a proper activity and tonus. In some of the lower animals it is the activating nerve to the electrical organs, and we can appreciate how the electrical discharges down through this nerve, because all nerve force is electrical, to the ganglia which are distributed through the entire nerve net, can induce so much tone and action.

There are times when this becomes very evident in conditions which are known as peristaltic unrest, when the bowels are moving rapidly and continuously. If they contain gas, the noises are audible. Wave follows wave. Then perhaps suddenly all is quiet. Again, there may be times when the sympathetic closes the sphincter, the pneumogastric producing a peristaltic condition almost choreic, when for hours or days there will be a tremendous churning of the intestines. Gradually it will quiet down, the sphincter will open, and there will be the usual passage on of content.

There is a wave, appreciated only by delicate instruments, which runs down the entire length of the intestine. The veins of the intestine as they pass through the fibrous tissue into the mesentery are provided with valves, as are the lymphatics. Every time the intestine contracts, the blood is forced into the veins and up to the liver. Mall has studied this action very carefully, and considers that the intestine is the heart or circulatory organ of the liver, and the lymphatic system of the intestinal tract. In order that there may be circulation of blood and of lymph when the intestine is apparently quiescent, this wave, which comes down the entire length of the intestinal canal, acts and is a reminder of the primitive heart.

In 1705, Hook published a work in which he suggested that it

may be possible to discover the motions of the internal parts of the body by the sounds they make. Cannon, it is said, used to retire with his stethoscope on his abdomen, going to sleep listening to the sounds and studying them. Some of our writers state that auscultation of the abdomen is valueless and nothing important is heard or discovered; but we have made it a point for a number of years to auscultate every abdomen that has any enteric process. Generally, little of value is heard, but there are times when conditions are noted which are of immense importance. Conditions of peristaltic unrest are not understood except through auscultation. Simulations of intestinal obstruction can only be differentiated this way. The atonic state of gut, so common in women, will give us sounds which are a clue to the condition existing.

When there seems to be a true ileus, when we have a case of acute abdomen in which we suspect obstruction, frequent auscultation is of much value. As soon as we hear a tinkle, then we should feel quite sure that an operation will be demanded; or, if putting the ear just above the pubes we hear the heart sounds as distinctly as at the epigastrium, there should not be an hour's delay. It is possible that by frequent and studied observation of the sounds of the abdomen more points of importance may be discovered.

The myenteric net being partly nerve tissue and partly neuromuscular, and being indirectly connected with the nervous system, is completely autonomic. It is a separate nervous system, controlled to a certain extent and kept within bounds of energy action by the sympathetic on the one side and by the motor nerve, the vagus, on the other. Most of the work the intestine is called upon to perform is accomplished through the nerve net. Stimuli coming to it from the gut and chemical irritations of the mucous membrane to the terminal filaments of nerve there, may pass up to the submucous plexus and then on to the myenteric net.

The activities of this net are more pronounced and more easily induced when put on a stretch—an inheritance from its ancestors in lower life. If the intestine be exposed to the air, there follows a rapid evaporation of the carbonic acid of its contained fluids, carbonic acid being the hormone of the nerve net, the same as adrenalin is of the sympathetic, and as choline, a derivative of lecithine, seems to be of the vagus. Without the carbonic acid in the substance of the intestinal wall, there is inactivity of the nerve net, a paretic condition lasting indefinitely and an inability to contract against the gases formed in the intestinal lumen, working toward the condition surgically known as ileus.

The gut is a mesial organ, being very long, and in its development takes on convolutions, the large intestine passing over to the right and descending, ordinarily becoming attached to the posterior wall without a mesentery, the cecum being found at the brim of the pelvis. In this region there are perhaps more defects of development than any other part of the body. Sometimes it is an overgrowth of cecum, allowing it to drop deeply into the pelvis, with the production of a certain amount of drag and disturbance of the sensitive polarized area at the terminal ileum.

The gut is held in position by embryonal bands, some passing over to the colon giving it support, others passing up on the mesentery of the terminal end of the ileum. The cecum is generally free. The stress of the upright position may occasionally convert this normal fibrous tissue into a pathological one, later to contract, and in its contraction disturb the relations of the gut and apparently interfere with its action.

The roentgenologist, viewing the upper abdomen, discovers dilated duodenums; and the surgeon also has noted the frequency of this condition. Both find a correlation between it and that which disturbs the tissues at the ileocecal region, whether bands or ptosis. Every case of cecoappendicular deformity, so-called chronic appendicitis, met in our experience, has been associated with dilated duodenum, disturbed gastric action and gastric flatulence very often associated with a type of cholecystitis, and not infrequently with a spastic condition of the descending colon.

It is curious to look back into the history of this region and see how at one time we looked upon these bands and attachments as being primarily pathologic. Only a year or two before the war, Lane was removing the entire colon for what he called, not an anatomical, but a physiological perversion,—mutilating surgery which seems to-day quite unnecessary, for certainly very few colectomies now take place; and those who used to exhibit their long tubes now keep them in their darkest closets.

Before attempting to relieve a person of distressing symptoms by operative means of cure, which may be mutilative, we should try to gather in our minds with great accuracy the conditions which may be the origin of the trouble and to know the component parts of the myenteric net and their functions, as well as their pathology.

One forceful thing was recently brought out by Crile, that sturdy exercising in the open, building up the musculature of the body, making it stronger by feeding it more oxygen, had a very evident

effect upon the intestine, consequently there must also be some effect upon the neuromuscular tissue and the nerve net.

A few generations ago the physician occupied the whole field, both medicine and surgery; then the specialties gradually developed. As medicine grew, the result of animal experimentation and growth of other sciences, specialties grew, so that now we have an overgrowth of specialization, with a tendency to build a trench around each. In all these years we have been taught of the microcosm and the inter-relation of tissues, yet in our active work practically forgetting it. The time has come when we must accede to the overlapping, and in our practice, as well as in our writings, begin to knit the different specialties together, so that practice and study may not be warped by a biased viewpoint.

The working out of this paper was greatly embarrassed because of the fact that the embryologist paid little attention to histology; and neither he nor the histologist, to physiology. Comparative anatomy was seldom referred to, yet a knowledge of them all is necessary for a proper understanding of the architecture and function of the myenteric nerve net.

LITERATURE SEARCHED IN ORDER TO BETTER EVALUATE THE TECHNICAL POINTS IN THIS PAPER.

1. Alvarez. *American Journal of Physiology*, March, 1918.
2. Austin. *Diseases of the Digestive Tract*, St. Louis, 1916.
3. Carman & Miller. Roentgen Diagnosis of Diseases of the Alimentary Canal, Phila., 1917.
4. Cannon. Mechanical Influence in Digestion, Lond., 1911.
5. Cohnheim. Diseases of the Digestive Canal, Phil., 1909.
6. Conklin. Heredity and Environment, Princeton, 1916.
7. Cushing. Pituitary Body and its Disorders, Phila., 1912.
8. Cushny. Therapeutics, Phila., 1906.
9. Eppinger & Hess. Vagatonia, N. Y., 1917.
10. Forescheimer. Therapeusis of Internal Diseases, N. Y., 1917.
11. Gaskell. Involuntary Nervous System, Lond., 1916.
12. Haeckel. Evolution of Man, N. Y., 1905.
13. Harrigan. Acute Dilatation of the Stomach, in *Annals of Surgery*, May, 1919.
14. Harvey. *Annals of Surgery*, June, 1918.
15. Heisler. Textbook of Embryology, Phila., 1899.
16. Hertz. Constipation and Allied Disorders, Lond., 1909.
17. Hirschfelder. Diseases of the Heart and Aorta, Phila., 1918.
18. Hill, Alex. Body at Work, Lond., 1908.
19. Hill, L. J. Further Advances in Physiology, Lond., 1909.
20. Howells. Textbook of Physiology, Phila., 1915.
21. Huxley. Anatomy of the Vertebrated Animals, N. Y., 1872.

22. Keith. In *Lancet*, August 21, 1915.
23. Keibel & Mall. Manual of Human Embryology, Phila., 1910.
24. Kennedy. Standardization of Surgery, in JOURNAL OF OBSTETRICS, June, 1919.
25. Klein. Atlas of Histology, Phila., 1880.
26. Lamarck. Zoological Philosophy, France, 1809.
27. Ligat. Significance and Surgical Value of Certain Abdominal Reflexes, in *Lancet*, May 3, 1919.
28. Loeb. Studies in General Physiology, Chicago, 1906.
29. Luciani. Human Physiology, Lond., 1913.
30. McCallum. Textbook of Pathology, Phila., 1916.
31. MacKenzie. Diseases of the Heart, Lond., 1914.
32. McLeod. Physiology and Biochemistry in Modern Medicine. St. Louis, 1918.
33. Mall. In *Johns Hopkins Hospital Reports*, Balt., 1896.
34. Meyer & Gottlieb. Pharmacology, Phila., 1914.
35. Obelmeyer. In Nothnagel's Encyclopedia: Diseases of the Intestines and Peritoneum, Phila., 1904.
36. Parker. Elementary Nervous System. Phila., 1918.
37. Pottenger. Symptoms of Visceral Diseases, St. Louis, 1919.
38. Practical Medicine Series (Barclay), vol. 6, Chicago, 1916.
39. Prentiss & Arey. Textbook of Embryology, Phila., 1908.
40. Robinson. Abdominal Brain, Hammond, 1907.
41. Shaefer. Textbook of Physiology, N. Y., 1900.
42. Sherrington. Integrative Action of the Nervous System, New Haven, 1911.
43. Starling. Human Physiology, Phila., 1912.
44. Starling. Recent Advances in Physiology of the Intestines, Lond., 1906.
45. Strickler. Manual of Histology, N. Y., 1872.
46. Tibbles. Theory of Ions, Lond., 1908.
47. Tweedy. Sympathetic System, in *Lancet*, May 17, 1919.

SHORT INCISIONS VERSUS LONG INCISIONS.

BY

ROBERT T. MORRIS, M. D., F. A. C. S.,

New York, N. Y.

Among the biologists, Loeb asked why it was that the living cell digested the dead cell, but did not digest other living cells. His studies in this subject were put into practical application in relation to surgery by Turck, who showed, experimentally, that the dead cell, when taken into the vascular system of the blood by way of the lymphatics, acts like a protein poison and may cause death in an animal employed for experimental purposes. This is presumably true in a surgical patient under certain circumstances. Turck killed animals experimentally with their own dead tissues. He deducted the conclusion that the absorption of certain enzymes, or proteins, set free from injured cells in the course of operative work is an important factor in what we know as surgical shock.

Crile in his explanation of the symptoms of surgical shock, has shown that, when harmful impulses are sent into centers of consciousness, a destructive process takes place within the brain and the nerve cells receiving that sort of impulse.

Here we have two separate theories in relation to shock with a record of experiments leading to practical conclusions. Let us assume that both conditions, as stated, are present as factors in shock. A natural deduction then will be to the effect that we are to avoid, as far as possible, the introduction of these two factors in the course of operative work. The more extensive the incision in surgical operations, the more enzymes, or protein poisons, are set free from injured cells. The more we manipulate tissues in the course of an operation, so much the more do injured cells set free their contents which are absorbed by way of the lymphatics. The longer the incision, so much more of destructive impulse is sent into the patient's centers of consciousness. We arrive by *reductio ad absurdum* at the conclusion that the harder a man is hit on the head with a hammer, the more consequences must he suffer. The larger the surgical incision, the greater the degree of shock. In our operative work we are to employ as short incisions, and as little manipulation of tissues, as may suffice for our purpose.

We are brought into conflict with another principle. An operator who is not very expert requires a great deal of room for his work. He must work by sight. He must work through an incision, perhaps many inches in length, in a case in which a more expert operator would perform his work through a much shorter incision. In other words, the very short incision is the one which, on general principles, gives the smallest proportion of toxic influence from injured cells and the least degree of destructive nerve impulse. In the course of perfection of operative technic, in a mechanical way and because of the safety of modern methods of anesthesia, surgeons are prone to dismiss the two shock factors which may not be sufficiently prominent to jeopardize the patient's life, but which may distinctly prolong his period of morbidity. It is desirable to employ the shortest incision through which one may work quickly, safely, and comfortably in the interest of the patient.

I have been misunderstood on that point. I have never argued in favor of the inch and a half incision in appendicitis, except as one feels, as a result of experience, that he may employ it safely and comfortably in the interest of the patient. If a given surgeon requires an incision eight inches in length, in a given case, let him make that sort of incision in order to be sure of the mechanical part of his technic. If, on the other hand, as a result of increased experience he finds that his skill has been developed to such a point that he may accomplish the same work through a short incision, let him use the short incision.

It may seem strange that there should be argument to the contrary on this subject, but there is; and I have found opponents to the idea of the short incision in every part of the civilized world. Yet the idea of the short incision went around the world for the very reason that it was made a subject of discussion. It is a matter about which there may be some misunderstanding; but on the basis of the newer physiology of operative surgical work, we may at least hold in mind the idea of keeping injurious enzymes and protein poisons out of the circulation of the individual, and prevent destructive impulses being sent into the centers of consciousness of the patient.

DISCUSSION ON THE PAPER OF DR. MORRIS

Dr. K. Isadore Sanes, Pittsburgh, Pennsylvania.—There cannot be any argument against the use of a small incision wherever it is possible to do so. There are two reasons why frequently large incisions should be made: first, for the purpose of exploring the abdomen in cases of indefinite diagnosis; and, secondly, to protect

better the peritoneal cavity from the septic material found during the operation. Operating on a tubo-ovarian abscess, for instance, through a large incision enables you to wall off the abdominal organs carefully without disturbing the contents of the abdomen, and in this way you not only reduce the danger of infection, but also of shock.

Dr. Morris (closing the discussion).—As to the question of having room for handling septic tissues, I made a very strong point against leaving them alone very thoroughly and turning the patient over to himself, giving him home rule, and managing that question with his own leukocytes. A physician, who saw me do work years ago said, "You are advocating a large incison for the purpose of exposing and getting rid of the pathology." I replied: "That was twenty-five years ago; I have changed my opinion so many times since then, that I trust no one has confidence in me." (Laughter.) The point is this: I do not now attempt to dispose of the pathology, because in practical work, in working through a short incision I have found, for instance, in appendicitis cases that if you run as soon as the pus runs, the patient will get well. As soon as the pus runs, run yourself. Do not forget that. In former years I opened the abdomen, washed it out, and got rid of the pathology, and sometimes got rid of the patient. I found we could reduce a very high death rate to a very small percentage by following the plan of working through a large incision, turning the patient over to himself, giving him home rule, and not attempting to do all myself.

SOME LESSONS FROM THE WAR FOR ABDOMINAL SURGEONS AND OTHERS.

BY

ROLAND E. SKEEL, M. D.,

Cleveland, Ohio.

I TRUST that no one fears I am about to inflict upon this meeting a full-grown paper on personal experiences in war surgery. There are many reasons why this should not be done, the main one being the lack of parallelism between the surgery of this war and the surgery of peace. Further, a year and more ago I sent over from France a paper indicating that by reason of the organization of the Medical Department of the Army and the demarcation of medical department activities into zones running parallel to the front, the enormous clinical laboratory which was offered would yield almost nothing of scientific value; and that while much could be learned under proper methods of organization, but little relatively would be. Such has proved the case.

Later, on a more fitting occasion, I hope to have something to say on the folly of attempting to make soldiers of doctors, and to offer a tentative plan by which all medical men outside of combat units can follow their legitimate occupation in time of war to the better advantage of their patients, who are soldiers, and thus to the advantage of all.

At this time I shall offer only the comment that in my own observation those hospitals—and more especially evacuation hospitals—with which I came in contact did the best work in proportion as military rank was forgotten and professional ability was given full scope, regardless of whether its possessor was a lieutenant or a colonel. It must be remembered that Army rank as it applied to doctors inducted from civilian life was originally the product of a mixture in indefinite proportions of influence, the accident of circumstances, and *known* professional ability.

Out of this vast welter of dirt and blood, disease and injury, however, there could not help arising a few salient facts having a bearing on the surgery of civil life; and it is upon a few of these I wish to touch briefly, not as the result of personal experience alone, for any one man's experience was at best but a limited affair, but

as indicating the experience and results of those with whom I had the privilege of associating. Some of the conclusions may sound dogmatic, but they must be excused on the ground of the necessity for being concise.

First and foremost, as was true a year ago, is the definite demonstration of the unquestioned value, almost absolute in degree when properly administered, of tetanus antitoxin as a prophylactic measure. It is rare indeed that, in the minds of all concerned, so unanimous an opinion exists on any subject as on this one. While many details of refinement concerning dosage and its repetition, the necessity for its administration preceding any operation on sequestra that have been contaminated even months before, and so forth, may be clarified in the future, it stands as absolutely demonstrated that antitetanic serum in proper dosage does and will prevent the development of tetanus in patients who are the victims of the most seriously contaminated wounds.

SHOCK.

In my own mind it stands clearly delineated that there are a variety of things which eventuate in that condition which we call shock; there is no such thing as shock as an entity, any more than puerperal fever is an entity; that the only definition of shock which will stand the test of time is that it is a lowering of all the vital functions produced by a number of agencies; and that this lowering, if allowed to proceed unchecked, will result as the next palpable step downward in that which we term death. That there is a psychic shock, I am convinced; indeed, it has been known almost from time immemorial, as is proved by the condition of a neurotic when he is desperately frightened. This showed plainly in numbers of slightly wounded immediately after injury, and passed off when the patient realized the triviality of the wound.

That severe crushing of the extremities produces almost immediate shock, even in the absence of conscious pain or severe hemorrhage, is undoubted; and that patients who have rallied from this shock may have it precipitated again, either by exposure to cold or such movement of the extremity as produces severe pain, is also certain. That prolonged rough handling of abdominal viscera and traction on mesenteries is productive of shock lies within the experience of every abdominal surgeon; while shock as the result of moderate hemorrhage plus prolonged etherization is occasionally seen. There still remains, however, a residuum of cases in which none of these are operative; and Henderson's theory of carbon dioxide exosmosis or Cannon's of

the development of toxin in devitalized muscle may be called upon to explain these. In certain instances the one theory may be applied, while in others the second seems to offer an adequate explanation.

To assert, then, that shock is the result of any one etiologic agent seems illogical, but once it is inaugurated, the vicious circle of lowered arterial pressure with consequent defective blood supply and insufficient oxygenation of the medulla presents a picture which is unmistakable.

The value of certain procedures in treatment was definitely established clinically by the experience of war. These were, first, relief from extreme pain; second, the warming of a patient who was cold; third, the value of hot liquid food as a decided stimulant; fourth, the fact that the use either of saline or sodium bicarbonate solutions intravenously, subcutaneously, or per rectum was of value as a *temporary expedient* only; and fifth, the discovery that blood transfusion, more than any one measure, was applicable in overcoming any and every type of shock other than that of psychic origin. The theory of this last we will not discuss—we may even question whether we know much regarding it—but the clinical fact is established beyond peradventure in the minds of those who witnessed its results.

The utter inadequacy of saline and sodium bicarbonate solutions came as a surprise to many of us who had depended upon them in civil life, for it seemed to be a complete contradiction of our previous experience. The explanation probably lies in the fact that even a moderate degree of shock is regarded with apprehension in our private patients, that the temporary rise in blood pressure produced by intravenous infusion serves to tide them over a short crisis, and that many of our abdominal patients are suffering from dehydration brought about by the illogical and unnecessary purgation to which many surgeons still cling, or by persistent vomiting, as in some cases of acute abdominal infection and intestinal obstruction. This, of course, is neutralized by the administration of fluids in any manner by which they can be retained and absorbed.

WOUNDS OF THE ABDOMINAL VISCERA.

But little of importance was gained in our knowledge of intra-abdominal injuries. Two things only stand out with any distinctness in my own mind.

The first of these is the fact that the most extensive injuries to the liver are not incompatible with life unless the injury is of such

character as to be almost immediately fatal. No surgeon, I think, who had much experience either on the field or with forward-area operating units will hesitate in the future to do the most extensive liver resections, provided he is equipped with an efficient thermocautery. The extent of liver destruction which still permitted of recovery was a perennial source of astonishment. One of my own cases that recovered lost a transverse section of the entire upper abdominal wall some three inches in width, with a groove in the liver substance which almost bisected it. In fact, the lower half of the liver was stitched into the defect in the abdominal wall to prevent extrusion of the intestines.

The other point was first pointed out to me by Major John Anderson, R. A. M. C., and has reference to the almost constant ratio between pre-operative pulse rate and mortality in perforating abdominal injuries. As this was mentioned last year, I bring it up again merely to stimulate discussion. Major Anderson's original publication on this subject is not available at this writing, but in graphic form he has shown that, beginning with a pulse rate of 70, the operative mortality is practically zero; while at the other extreme a pulse rate of 140 means that the recovery rate is zero, and the gradation of the death rate between these points varies almost in exact proportion with the pulse rate. Secondarily, this means that the element of time is of vast importance, that the increasing anemia and shocking effect of the rapid diffusion of blood into the peritoneal cavity must be stopped at the earliest possible moment, and that the peritoneum must not be permitted to pass from the contaminated to the infected stage. A well-defined sign, such as the pulse rate proved to be, is a better indication than the number of hours which had elapsed since the wound was inflicted.

ABDOMINOTHORACIC INJURIES.

In civil life abdominothoracic injuries are largely confined to bullet wounds and knife thrusts, in which oft times the thoracic injury can be ignored so far as operative intervention is concerned, whereas battle injuries consisted more often of the smashing, tearing effect of jagged shell fragments, in which damage to the chest wall, lung, and diaphragm were of as serious a nature as the intra-abdominal lesion. The direct lessons are therefore of but little use in civil life; but one very important feature brought out was the ease with which the diaphragm could be sutured from the thoracic side—a matter which never should be forgotten in diaphragmatic hernia.

PENETRATING WOUNDS OF THE THORAX.

This subject does not interest abdominal surgeons who confine their work to the abdomen, a thing which most of us do not. Much was learned of the impunity with which the lung itself could be handled, partially withdrawn from the thorax, incised, and sutured, and of its resistance to infection, while increased experience led to increased care of the pleural membrane because of its lack of resistance to infecting agents.

A penetrating wound of the thorax and lung, even with extensive hemorrhage which did not permit the ingress and egress of air with each respiratory movement came to be the subject of marked conservatism, unless the resulting hæmothorax became infected. The contrary was true of open sucking wounds of the chest. The profound shock and appearance of impending death were never overcome until the entrance and exit of air was prevented by some kind of closure of the chest wall, the effects of which were almost instantaneous in their appearance. Obviously there are but two possible explanations of this condition; the shocking effect of the air upon the pleura, which is doubtful, and the side to side excursions of the mediastium. They are mentioned here only to serve as a word of caution, because the emphasis laid in some published articles upon the impunity with which the lung can be attacked conveys but a faint impression of the true risk which resides in *open* pneumo thorax without adhesions, in which the intra- and extra-thoracic pressure is not balanced by some form of anesthesia under pressure.

INFECTION.

On considering the subject of infection, I think that but little was learned of its treatment. Regarding its prophylaxis, those of us who can hark back to the time when aseptic and antiseptic surgery was in its swaddling clothes have an explanation for something which must have puzzled us more than once; that is, if the most minute and painstaking asepsis is necessary for the healing of surgical wounds or for the lives of those upon whom these wounds are inflicted, why did any patients of surgeons of the pre-Listerian era survive? The answer as taught by experience in front-line operating organizations is very simple. Speed and dexterity in operating are the minor factor, and wide open drainage is the major. Without adequate asepsis—and adequate asepsis was unheard-of at the front in a rush—the open wound without suture meant recovery; the closed

wound frequently meant death, loss of limb, or prolonged suppuration. It would be interesting to deal with individual infections like those produced by the various anærobic gas-forming bacilli so common there, so rare here; or with the demonstrated resistance of synovial membrane to infection, which was not always resistance so much as increased care to prevent contamination, of the newer treatment of fractures; but this is neither the time nor the place for such discussion. I do wish, however, to quote three high authorities on the efficiency of the medical officers in France.

(1) Brigadier-General Winter says, "I beieve it will not be questioned that the Medical Department in France came out of this war with the hall-mark of sound quality and excellent service stamped on it. To do big things successfully must rest with the human factor put to the work, and in our personnel we found our most potent agent for good.

"I do not wish to convey the impression that it was only in these units that our doctor men were shining lights. There was much excellence along the lines, and first class medical talent functioned at many small camp hospitals and in detached units. On course, we got some goats among the sheep, and I have always deplored the fact that the first officer dismissed by general court-martial in the A. E. F. for drunkenness was a medical officer. But these delinquents were notably the exceptions, and one may never hope to find a more altruistic, self-sacrificing, devoted set of men than the medical officers who carried the burden in the lines of communications during my identification with it. And they were the fellows, fresh from civil life, who bore the brunt and did the chores in cheerful coöperation with the handful of regular medical officers who were available for duty abroad.

"Just here it is fitting to say that we went along as a very happy family in France and England without any internecine strife, based on contention between the man from civil life and his professional brother who had made the service his life calling. I may again refer to the fact that we had some regular officers who failed in their work and brought discords, just as we had a sprinkling of non-adaptables among our Medical Reserve Corps men; but I believe the vast majority of the Regulars and the M. R. C. will agree with me that, long before the War Department merged everything into the Medical Corps, U. S. Army, by official fiat, our working agreement and unification had been accomplished and our seal might in all reason have carried the legend *E Pluribus Unum*. It is my thorough conviction that practically every thinking, efficient man who comes

back from France carries in his heart a sense of close affiliation with the old Medical Corps and is imbued with a keen desire to help us solve our problems in the future."

(2) An editorial in the *Journal of the A. M. A.* makes the following statement: "Statistics published this week in the Medical Mobilization and the War department show that the Medical Department of the Army established an enviable record during the war. The yardstick with which to measure the work of this department is the effective list, and the records show that, on an average, 94.3 per cent. of our army were effective for duty; of the remaining 5.7 per cent., only 3.4 per cent. were on the noneffective list because of disease. The medical corps of an army is put to its hardest test when it follows the army into action. The total number of American soldiers wounded was 195,000, of whom the Medical Corps saved the lives of 182,000; of these there are but few who carry empty sleeves or use artificial legs. And so the figures go: a venereal disease rate lower than that of any of the Allied or enemy forces; typhoid fever practically eliminated, and a rate from even the dread scourge pneumonia that was less than might have been expected under the conditions."

Weekly Bulletin No. 38 from the Office of the Chief Surgeon S. O. S., A. E. F., France, under date of December 30, 1918.

"Of 686 deaths occurring in 11 hospitals in the District of Paris in five months, July to November, 1918, autopsy was made in 644 or 95.5 per cent.

"*Gas Gangrene.*—During the "pushes," cases dying of gas gangrene became alarmingly frequent. In the first 100 autopsies 42 showed this condition as the immediate cause of death. Consequently, by informal conferences, formal meetings, and specimen demonstrations, repeated efforts were made to impress on the surgeons (1) the necessity of early diagnosis of these cases; (2) the principles governing the development of the conditions; (3) useful methods of making such diagnosis; and (4) the proper methods of avoiding the condition or treating it after it had developed. One particularly useful method of early diagnosis was urged.

"*Compound Fracture of the Femur.*—These cases constituted a discouragingly large proportion of the deaths occurring in this district among the wounded, and much attention has been devoted to the question of their proper treatment. Universal early amputation in ALL such cases is strongly indicated if one considers only the facts presented on the post-mortem table. Clinical consideration would probably modify this rule somewhat, but the conclusion is

inevitable that in the vast majority of those cases which died, more radical early treatment would have materially increased the chances of recovery. Even if such a rule caused unnecessary mutilation, in some cases it has seemed clearly proved that the rule would be wholly justified. The saving of a leg with the risk of death, or long-continued suppuration, general sepsis, and subsequent amputation, or a long period of sickness with repeated operations for sequestra, the formation of chronic sinuses, the poisoning of the vital organs of the body by toxins constantly absorbed, and finally a shortened and badly deformed and even incompetent limb is a subject to which insufficient attention has been given. It has been often pointed out in our autopsy service that these cases are mostly those of *preventable deaths.*

"*Surgical Operations.*—Lack of anatomical knowledge demonstrated by many of our surgeons was a feature of some post mortems. Mistaking a stomach for the colon, or vice versa, failure to know the boundaries of the chest, forgetting the proximity of large vessels and nerves to wounds, were often noted. Hence it was repeatedly urged, especially on younger surgeons, that the post-mortem room furnished most exceptional advantages for reviewing not only their knowledge of anatomy, but also their surgical technique by actual operations on the cadaver. Several men availed themselves of such opportunities. More work in this line could have been done. The interest shown by the younger surgeons, in their operative cases especially, in learning where they had failed, was very encouraging."

REFERENCES.

1. Brigadier-General Francis A. Winter: The Medical Department in the lines of Communication, A. E. F.: Military Surgeon 44 : 588 June, 1919.

2. Editorial: The Health of the Army: *J. A. M. A.*, 72, 1682; June 7, 1919.

3. Weekly Bulletin No. 38 from the Office of the Chief Surgeon S. O. S., A. E. F., France, under date of December 30, 1918.

WHICH IS RIGHT?

From a knowledge gained by first-hand observation during all of the purely American drives, I should say that, *considering all the circumstances,* American surgeons acquitted themselves magnificently. One lesson however, was driven home: that stripping medical officers of their insignia of rank and making them pick cigarette butts from a camp parade ground does not contribute to

their enthusiasm or enhance their knowledge of military surgery, that a knowledge of horse-back riding and how to wear spurs was of no especial assistance to the man who must ride on a truck or walk in order to arrive at his destination; and that courses of instruction in military surgery given by men who never saw a war wound, and whose clinical material consisted in a great measure of enlarged thyroids, gastric ulcers, and uterine myoma gave a rather inadequate idea of how to excise dead muscle, splint a compound comminuted fracture of the femur, or extract a fragment of shell with dirty clothing attached from *x*-ray localization or under the fluoroscopic screen.

It is my belief that every patriotic surgeon should be interested in this phase of war surgery to at least an equal extent with that of its purely professional aspect, to the end that the blunders in training medical officers may not be again committed, and so that in the next war, which we hope will not occur, but which we know is bound to occur, the profession may acquit itself not "magnificently, under the circumstances," but magnificiently without qualifications.

DISCUSSION ON THE PAPER OF DR. ROLAND E. SKEEL.

Dr. George W. Crile, Cleveland, Ohio.—Mr. President: First of all, I want to say that there is nothing in Dr. Skeel's paper to which I cannot subscribe. I know of Dr. Skeel's work. He held some of the most difficult positions. He was under fire; he was in the front line and worked under all possible conditions, hence he is in a position to speak with authority.

There is one thing I should like to add. At the time of the great Argonne offensive, unfortunately we had only 45 per cent. of the quota of medical officers that we should have had, and what Dr. Skeel has said is true. It was necessary to employ at the operating table the services of many medical men who were not sufficiently qualified for such work. If we had had a full quota of men, who had had six months' experience, much better work would have been done. However, taking all things into account and considering all the shortcomings due to war conditions, I think the American Expeditionary Medical Department did splendidly.

I want to emphasize the point that we ought to hear very much more than we do from the men who, like Dr. Skeel, did front area work.

We should also hear from the young regimental surgeons, who went out and lived with the battalions, lived in the British service, and went over the top.

Dr. Frederick S. Wetherell, Syracuse, New York (by invitation).—In regard to Doctor Skeel's plea for more professional training or for more training in war surgery in place of training in military lines, which was practised in Chattanooga at Fort Oglethorpe, I

will say that it was not until in August of last year (1918) that a real effort was made in Chattanooga to teach anything in the way of war surgery. At that time a school of anatomy was established in Chattanooga, in one of the buildings of Chattanooga University. It was my privilege, and the privilege of Dr. Chandler to give instruction in that school, in surgical anatomy; and to be perfectly frank, it was appalling to see the lack of anatomical knowledge on the part of a great many men, who, when they came to Fort Oglethorpe admitted they were surgeons. We had the opportunity of finding out in this school just how much surgical training a man had had. Many of the men were positively not surgeons, but if this school had not been established they would have gone through, and no one knows what responsible positions they might have occupied. These men were weeded out. If the occasion should again arise for training men for another war, it would be better for the government to establish schools, if not of surgery, at least to teach simple anatomy; teaching all Medical Officers, at least the relation of the more important structures (nerves and blood-vessels) of the body.

Dr. Joseph A. Hall, Cincinnati, Ohio.—May I qualify my statement by another? I should like to ask Dr. Crile if he does not think operating teams organized in the back areas which came forward when any big action occurred could not have been better trained than they were if more opportunity had been given them to go to such clinics as those of Dr. Crile and the Mayos, rather than have all their time taken up in doing chores or far less important work.

Dr. Crile.—I realize the point made by Dr. Hall is well taken, and it is a question we ought to have a great deal of time to discuss.

Commander William Seaman Bainbridge, New York City. This subject is so large and so pressing in upon those of us who have seen work at the front, as I did for some time with the allied armies as well as with our own, that at the coming meeting of the American Association of Military Surgeons, to be held in St. Louis, a great deal of time will be devoted to this subject. I myself am down for a paper to be read at that meeting, and in it I am going to emphasize the absolute necessity of a close relationship between the surgeon in civil life and the surgeons in military and naval service, and a closer touch between the hospitals of the military branch and those of civil life. Plenty of time will be taken up with that discussion, and one of the great lessons I had pushed in upon me was the absolute necessity for greater preparation for our men who came from civil hospitals. On the other hand, the military surgeons will be helped by closer touch with the civilian hospitals and with the civilian surgeons.

Dr. Skeel (closing the discussion).—In regard to preparedness we all know that we could not take an organization even so large as the gigantic steel corporation with from three hundred to five thousand employees and suddenly expand that to four millions and have it perfect. It would be a hodge podge for a time; and so it must be with the medical department of a large army suddenly

expanded from seven hundred trained to thirty thousand partially trained officers. If we sit down and study things out we will be ready when the next war comes while this time we were not and we made blunders because we were not ready. As Americans also we are pretty cocky, if I may use that expression, and unwilling to learn from foreigners as we considered the French and English. Because we were totally unprepared let me paraphrase Dr. Hall's remark by saying "Good Lord see what we failed to do!"

CANCER SIGNIFICANCE OF MAMMARY ADENOMA.

BY

WILLIAM J. GILLETTE, M. D.,

Surgeon to Robinwood Hospital,
Toledo, Ohio.

Case I.—WITHIN the past year a patient of mine died of mammary cancer with the following history. At the time of her death she was thirty-six years of age. She has been the mother of three children. Eighteen months prior to her first visit to me she had found a small lump in her left breast and had it removed by a well known surgeon in a neighboring city; the latter sent the "lump" for examination to the laboratory of one of the best known and respected pathologists in this country, and received the following report.

"I have examined the specimen of tumor which you sent me. It proves to be an adenofibroma with cystic ducts, and shows marked evidences of chronic inflammation. There is no malignancy in the material examined, and there should be no recurrence following a thorough local excision of such nodules as these."

Basing his opinion upon this report the operating surgeon assured the patient in a most emphatic manner that she need have no further concern about her breast, that the tumor was entirely innocent and would not recur. Within a year it did recur and was removed, when the surgeon again assured her of its innocence. The tumor however, shortly reappeared for the third time, growing with great rapidity. She now consulted me, and I found her suffering with an unmistakable advanced cancer of the breast, and the usual involvement of the axillary glands. The cancer development was decidedly most pronounced along the lines of incisions of her operations.

Case II.—On December 2, 1918, Mrs. L., aged forty-two years, mother of four children, presented herself to me for examination with the following history: Six months prior, she had a small growth removed from her left breast by a prominent surgeon, since, dead. His diagnosis of a small fibroadenoma, benign in character, was confirmed after its removal, by his pathologist, a man of well recognized ability. The patient was assured she need fear no recurrence.

Six months thereafter I saw her, when the growth had not only recurred, but had advanced so rapidly that almost the entire breast, together with the axillary glands, was involved with unmistakable cancer; and while I performed a most radical operation, a permanent cure is not probable. I have reported these two cases as typical of others I have seen, and which are met with all too frequently, I am sure, by other surgeons.

The question arises: Where is the error? Is it with the surgeon in depending for his prognosis upon the pathologist, or is it with the pathologist in not recognizing the lethal import of such growths? I think the fault lies with the latter; and it is a serious matter for, if the true character of such growths were recognized early as being of cancer import, and were then radically removed, the probabilities of their recurrence would be remote. I leave out the question of the wisdom of the removal of a growth from the breast and allowing several days to elapse before a definite report is made of its character. I am quite aware that adenomata of the breast are sometimes removed by simple enucleation, and that they do not recur; but such instances, I fear, are accidently fortunate; they are not cases upon which to base practice.

While the teachings of Rugge and Veit, that adenomata are invariably early stages of cancer, can hardly be maintained, yet they cannot be properly considered benign at any stage of their existence in the same sense as other tumors, such as lipomata, fibromata, enchondromata, osteomata, etc., in which the epithelial cell is a negative factor. Adenomata, as is well known, are made up largely of an aggregation of epithelial cells and belong to one of the three epithelial neoplasms; the other two being warts and cancer. This very fact makes adenomata of vastly greater lethal significance. Now as long as the epithelial cell remains confined within the membrana propria, which may be years, the growth can be spoken of as benign; but under the influence of some stimulus, as the trauma of an incomplete surgical operation or an infection, the cells break through the basement membrane and begin their lawless activities, with rapid mitosis which, usually, ends with the death of the patient.

With the full recognition that the epithelial cells of adenomata may very easily be set free, the surgeon will treat them with the same circumspection that he would deal with the coiled rattlesnake in the grass, and then disasters, such as the two cases reported in this paper, would seldom occur.

Pathologists are not of one accord that the adenomata are always benign. A study of the original slide, which we were fortunate

enough to obtain from Case I, was made by our pathologist, Dr. W. E. Moseley, who is agreed with the unfortunate diagnosis, benign adenoma, and presented the following interesting report:

"The specimen presents a mass of fully formed connective tissue with predominance of fibrillary elements. Scattered throughout are numerous gland acini, many of which are dilated, with a hyperplasia of epithelial elements arranged along typical lines. The lumen of these dilated glands contains a granular, poorly stained debris. Surrounding the glands, there is considerable round cell infiltration, containing numerous polymorphonculear leucocytes, an evidence of inflammation. Throughout the section there appear gland acini, the epithelial cells of which present a decidedly irregular and somewhat atypical arrangement in regard to their relationship to one another, as well as to the underlying basement membrane. This irregularity I do not consider as caused neither by the existing inflammatory process, nor by manipulations during the preparation of the slide, but rather the result of the preliminary rearrangement significant of early malignancy. The nuclei of many epithelial cells show a decided increase in the granular deposit, with a coalescence of the same, and a general rearrangement of epithelial cells and of nuclear changes, and presents sufficient characteristics which would justify its being considered a precancerous stage of a neoplasm." The slide will be presented on the screen. We were not so fortunate as to obtain a slide from Case II upon which a diagnosis of benign growth was made.

Conservative pathologists do not accept conclusions such as the above. Nor do they explain recurrences by stating that a portion of the tumor containing cancer was, in all probability, not removed; or that the tumor was shelled from its capsule, and the capsule, which is frequently the point of malignant origin, was allowed to remain; or that cancer existed at some other portion of the breast and was overlooked.

Nor do such explanations appeal to me. The cancer development in both cases reported was most marked along the lines of the incisions. If dependent cancer nodules had been present, they could hardly have been overlooked. It seems it is demonstrable that a precancerous condition existed in nearby terminal glands acini, which gave rise to an early postoperative invasion of epithelial cells into the nearby stroma. This condition should have been recognized.

There are three distinct types, or stages, the primary, secondary, and tertiary, in the transition from a normal glandular structure

to one of undisputed malignancy; recognizing them, we can intelligently determine the extent of a given operative procedure.

My experience leads me to believe that adenoma of the primary type, in individuals under thirty years of age, may be removed together with the capsule and a wide margin of the adjacent stroma, with a favorable prognosis; but in women over thirty years of age, even this type should be considered potentially malignant. Cases of secondary hyperplasia should be considered precancerous; and while they do not require so extensive an operation as the removal of the underlying muscles together with the axillary glands, yet no portion of the breast should be left.

The third type is the fully developed cancer, and should be treated as such. Let me urge, then, as has been done so many times by others, an early examination of all neoplasm of the breast by the pathologists; and, upon his diagnosis that the growth is adenoma, that the surgeon proceed immediately to perform a radical operation. With all due deference to the conservative pathologist, clinical experience proves that so-called benign adenomata of the mammary gland are often anything but benign. In the main, the teachings of such men as MacCarty, Ziegler, Bloodgood, Mallory, Bainbridge, Means, and Moseley are pretty generally accepted, namely, that recognizable conditions do exist which reveal the case as distinctly precancerous:

"The most essential characteristic of the development of cancer is that presented by atypical proliferations of epithelium which sooner or later, penetrate into the tissue bordering upon the affected glands or surface epithelium." Ernest Ziegler, M. D., General Pathology.

"In the fact that general pathologists have recognized only epitheial hyperplasia into the stroma as carcinoma and the dogmatism relative to the role which the very indefinite basement membrane has played, in being the histological arbitrary line of demarcation between benign and malignant conditions, has led to disastrous result." W. C. Mac Carty, M. D., Rochester, Minn., Surg. Gyn. Obst., March, 1914.

"The essential feature of cancer, whether it developes in a solid organ like the mamma, or on the covering surface of the skin, is the continuous proliferation of cells." W. S. Bainbridge, M. D. The Cancer Problem, p. 132.

"In 820 pathologically fully developed cancers, we were able to find in 100 per cent. of the cases a history of previous defect which

might be considered precancerous." J. C. Bloodgood, M. D., J. A., December 27, 1919.

"Others have held that there is a peculiar atypical character in the epithelial cells themselves, shown by irregular cell division, hyperchromatosis, and other features characteristic of precancerous stage." F. B. Mallory, A. M., M. D., Harvard; J. W. Means, M. D., Starling Medical; J. C. Bloodgood, M. D., Johns Hopkins.

On the other hand, the following do not recognize the foregoing conditions as of malignant import:

"I prefer to regard as carcinoma any epithelial growth atypically producing certain glandular or other structures and showing a manifest tendency to irregular extension." Alfred Stengel, M. D. Text-Book of Pathology.

"Carcinoma is a malignant tumor resulting from a progressive infiltrative hyperplasia of epithelial cells, which hyperplasia is accompanied by loss of that relationship of epithelial cells to the membrane propria." Joseph McFarland, M. D., Text-Book of Pathology.

"I regard the tendency of the epithelial proliferation to break through the normal limits and extend beyond the confines of the epithelial structures as the important fundamental element in carcinoma." A. S. Warthin, M. F., Ann Arbor, Mich.

Now, though these last quoted reputable pathologists disagree decidedly as to when tumors should be considered malignant, or as to what constitutes cancer, I contend that the only procedure for the surgeon is to deal with all mammary adenomata, especially when found during the cancer period of a woman's life, in a radical manner.

CANCER IN WOMEN. EDUCATIONAL CANCER CAMPAIGN AMONG THE MEDICAL PROFESSION AND AMONG THE LAITY.

BY

ANDRÉ CROTTI, M. D. LL.D., F. A. C. S.,
Chairman of the Ohio State Cancer Committee, Surgeon to Grant Hospital and Children's Hospital.

Columbus, Ohio.

THE *cancer problem* is still where we left it at the beginning of the war. No material advancement has been made in the knowledge of the etiology of the disease or in its treatment. It still goes on taking its annual toll as heretofore. Now, that we can go back to the problems of civil life, our purpose should be directed once more to trying to arrest the progress of cancer, and if possible, to killing this terrible Moloch who feeds himself upon the best of our human blood. I think it would be a good plan for this Society to adopt as its own, the German motto: "To the Day." You know that for years whenever the German officers would get gay and reckless, they would drink "To the Day," to the day when their conquest of the world would be an accomplished fact. We do not need to drink to that day; we could not anyway; but we can adopt the sober resolve to see that day through; not the day of conquest of the world, but the day when this terrible giant, *cancer*, will be down and out. And that day cannot come too soon since it is estimated that the increased death-rate in the U. S. is 2½ per cent. per annum. Whether this increase is real, or owing to earlier recognition of the disease and better statistics need not concern us. The slaughter is great enough as it is. Indeed, taking the death-rate in the U. S. as a basis, about 1,700,000 people died last year of cancer. Is not this enough? And the majority of these victims are women. Not because women are more pre-disposed to cancer than men, but because women have wombs; and also because they have fully developed and active breasts which are only rudimentary and inactive in men. It is true women have no prostate, but incidence of cancer in that organ cannot be compared to the one of cancer in the two above mentioned organs in women.

As said in the beginning, there is nothing very new in the etiology

of the disease, except that from time to time certain facts are brought forth which tend to narrow down our field of investigation. I am glad to see that we no longer content ourselves with the old definition, namely, that "cancer is a bunch of cells running amuck." It is not so much the fact that these cells are running amuck, which is of interest to us, what we want to know is: "Why they do so."

So far as I am personally concerned, I have always been partial to the infection theory; a cancerous mass always appeared to me as a low-grade infection, peculiar in its behavior, I am willing to grant, but, nevertheless, closely similar. Its hardness, its diffuse involvement of the neighboring tissues far from the growth itself, its involvement of the lymphnodes, its metastases, all these features are seen in local infections. The only difference is one of degree. In local infections the symptoms are more accentuated; that is all. The similarity is sometimes so close that many a competent surgeon has more than once hesitated in deciding whether a certain mass was malignant or only inflammatory in character and many knives have be stuck into a so-called abscess only to reveal a malignant tumor, and vice versa. I have seen cases of low-grade strumitis resembling in every respect a malignant goiter, yet there was no malignancy. And I recollect cases of malignant tumors of the neck, breast, and inguinal region are regarded as simple abscesses.

The difficulty encountered with that point of view is to explain the histological findings, because there is nothing there to suggest inflammation except, perhaps, the disorderly behavior of the cells spreading throughout the tissue as leukocytes do. Nevertheless, since the discovery of Peyton Rouss of filterable viruses, causing in chickens various types of sarcomata, as the *spindle-cell* sarcoma, the *clefted* sarcoma, and the *osteosarcoma*, each specific virus being able to produce that type of tumor and no other, the infection theory of cancer, is, at least, justifiable. From Rouss' findings it would appear, too, that it is no longer possible to admit the existence of a *single* virus in cancer. It is probable that, although belonging to the same species, the anatomical entities of the various cancer viruses are quite different.

One fact, however, seems to be well established, and that is, cancer nearly always develops at the site of some iritation, either mechanical, thermal, or chemical in nature. Thus cancer of the cervix frequently follows pre-existing lacerations; cancer of the breast, a mechanical injury or chronic mastitis; cancer of the sigmoid, a chronic diverticulitis; gall-stones are found in 85 per cent. of the carcinomata of the gall-bladder, and 50 per cent. of the carcinomata

of the kidneys are associated with stone in that organ. Women with uterine fibromata are many times more liable to cancer than women without them, and so on. So, we can conclude that the evidence of the relation of cancer to chronic irritation is overwhelming. In cases where no gross evidence of chronic injury is present, irritation of a finer character, possibly chemical, may be responsible for the appearance of the malignancy, as for instance, chronic endometritis in cancer of the fundus.

A very happy fact, however, remains that not all people with chronic irritations develop cancer. In other words, they seem to be immune, or if we want to put it differently, the ones who develop cancer seem to be predisposed to it. This would tend to show that there is in the blood serum a "something" present or possibly lacking, which would confer or destroy this apparent immunity. What it is we do not know.

Lately, some of the research workers seem to hold the glands of internal secretion responsible. Robertson and Burnett experimenting on rats came to the conclusion that the administration of emulsions of the anterior lobe of the pituitary body of the ox increases very markedly the rate of growth of primary tumors in rats inoculated with carcinomata. This acceleration is only evident, however, at a certain stage of growth of the tumor, subsequent to the 20th day succeeding inoculation. Noting that cancer develops rather in later life at a time when the thymus gland has undergone most of its involution, someone else has sought to establish the relationship between these two facts, malignancy and thymus insufficiency. Interesting as they may be, these facts still wait for further substantiation.

From all that I have just said, one of the outstanding features among the causative factors of cancer, is chronic irritation and while researches must still go on in the laboratories until something better is found, all that we can do for the present from a practical point of view, is to take this valuable piece of information into serious consideration and learn furthermore to detect the disease in its incipiency. We must spread the gospel among the members of our profession and among the laity as well, that every irritating or blood-streaked leucorrhea in women in middle life, although not necessarily malignant, must be taken into serious consideration, and demands an examination which should be pushed to the point of showing a satisfactory cause for the leucorrhea; that every erosion or ulceration of the cervix in the middle-aged woman should be regarded as a potential factor of cancer and should be treated with the prophylactic

measures against cancer; that all cases of marked increase of menstruation during middle life should be regarded as suspicious, all cases of intermittent menstrual flowing or recurrence of the flow after menopause as ominous, and all cases of sero-sanguineous flow as pathognomonic of cancer of the uterus. If we consider that at least 35 per cent. of the cases of cancer of the uterus are inoperable, and if we consider too that 75 per cent. of all cases come to the surgeon in the advanced stage, there is certainly room for improvement. There will always be cases, of course, where the only thing we can say is "Too late," but this can and must be reduced. When asked why she did not seek medical advice sooner despite her hemorrhages, a patient will often say, "I thought it was the change of life." These patients come too late because some friend, some neighbor, some midwife, the grocer, or even the doctor told them their hemorrhages were due to the change of life. They have missed the opportune time for cure, not because of a mistaken diagnosis, but because of a wrong conception, a most dangerous and most erroneous one, because it ascribes to a normal process, the menopause, what is in reality a symptom of the most dreaded disease, cancer of the uterus.

The same is true for cancer of the other organs, the breast, the stomach, the rectum, the thyroid, etc. Patients miss the opportune time for cure because of delay or lack of recognition of the conditions. Hence, the necessity for an educational campaign among the profession and among the laity.

In 1913, the American Society for the Control of Cancer was founded with the very purpose in view to disseminate better knowledge of cancer not only among the laity but among the medical profession also. Under the spur of their efforts a great deal of educational work has been done in the various states with the most gratifying results. In 1917, our Committee on Educational Matters of Interest to the Ohio State Medical Association had planned to undertake with the coöperation of the American Society for the Control of Cancer an educational campaign among the medical profession in the State of Ohio. The war, however, prevented us from carrying out our plans; everything had to be dropped except what was pertinent to the winning of the war. Now, that we are at peace again, our Committee feels that the educational campaign throughout the medical profession is a timely one.

Education of the Medical Profession.—Unfortunately, evidence is only too readily obtainable that some members of the profession are still guilty of negligence, carelessness, or even ignorance, concerning the early detection of malignant diseases. This sin is quite as

apt to be found among the metropolitan practitioners as well as in the remote districts. The investigations of the Pennsylvania Cancer Committee are often referred to as showing how great the physician's responsibility is, and how far he has failed to meet it. In 1911, four hundred reports were obtained from surgeons practicing throughout the state, the wide distribution of the returns in some measure offsetting the comparatively small number of cases The facts brought out by the Pennsylvania Cancer Committee are as follows:

1. On the average the patient's physician had known of the conditions present for one year in superficial and thirteen months in deep-seated cancer before any treatment was instituted.

2. Of superficial cancers only 68 per cent. and of deep-seated cancers only 48 per cent. were operable when first seen by the surgeon. In 39 per cent. of the superficial cancers and in 46 per cent. of the deep-seated cancers there had been a pre-cancerous condition, that is, a lesion which might have been cured by comparatively simple operative measures and the ensuing cancer prevented.

3. In superficial cancers, symptoms of the condition were apparent to the patients on an average of eighteen months before the surgeon saw them; in deep-seated cancers the average was fourteen months.

4. In 3 per cent. of the cases of cancer of the breast the physician first consulted failed to make any local examination, while in 13 per cent. he gave mal-advice to use local applications or "to wait and see what develops."

5. In stomach cases the physician made no local examination in 9 per cent. and gave mal-advice in 20 per cent.

6. In cancer of the cervix there was no local examination in 10 per cent. and mal-advice in 20 per cent. For the body of the uterus the figures were 10 per cent. and 10 per cent., for ovarian cancer 14 per cent. and 15 per cent. respectively.

Few physicians would deny that these conditions so carefully recorded in Pennsylvania would fail to apply to their own state and locality. With special reference to the time of delay of a year or more between the consultation with the family physician and the operative intervention, the remark of the Committee in its report that the results were "somewhat startling," is, perhaps, under the circumstances somewhat conservative. When it is recalled that the average time which elapses between the appearance of the primary growth and the appearance of the palpable metastases, varies from 8 to 15 months depending upon the seat and type of the growth,

such evidence of the failure of average practitioners to meet their responsibilities is indeed little short of appalling.

With that end in view our Committee is asking all the county medical societies to devote one or more of their meetings to cancer subjects. Speakers, if necessary, will be provided by our Committee. Mr. Martin, Secretary of the Ohio State Medical Association, who has kindly consented to become our secretary also, has at our request sent out letters to the various prominent surgeons and internists of all the medical districts of Ohio, asking their coöperation and also asking them if they would be willing to serve as speaker on given occasions. The answers so far have been very satisfactory and most of the men have shown a kind spirit of coöperation for which our Committee is very thankful.

It is hoped that next year a series of clinics on cancer by the best men that can be secured, will be given throughout the state. It was not possible to do so this year because plans for a state-wide educational campaign on another subject had already been made.

The Editor of the *Ohio State Medical Journal*, Dr. F. H. McMechan, and Secretary Martin have kindly consented to coöperate with us and to allow us in each monthly number of the Journal a certain amount of space which will be devoted to cancer subjects. Our Committee will then take the opportunity to go over the various phases of the cancer problem in as short and practicable manner as possible. Finally, a cancer number will be published sometime in the future, for which the coöperation of the most prominent men in the profession in the U. S. will be secured.

Boards of Health.—Our Committee will turn toward the State and Local Boards of Health for assistance. There are no other organizations so well equipped and so willing to do the utmost when it comes to questions of public health. The cancer problem is one of them.

Medical Schools.—Furthermore, our Committee will try to influence the various medical schools of the state to devote a certain number of lectures to cancer. It is while he is on the benches of the University when his mind is thirsty for knowledge that the medical student can be most readily impressed with the fundamental facts pertaining to any medical problem.

State Nursing Association.—Knowing how powerful is the nurse's influences for good, and how much more intimately than the physician she comes in contact with the public, the coöperation of the State Nursing Association and its various branches will be sought. With their consent, a series of lectures will be given to enlighten

them as to the aims of our cancer propaganda. Many times a patient will open her heart to the nurse, while she shrinks from the idea of consulting a doctor. There, intelligent advice may save a patient from disaster, consequently, the instruction of the nurses regarding the elementary danger signals of cancer is therefore of paramount importance in preparing them, not to offer a diagnosis, but to insist on professional consultation.

Social Workers.—The field agents and visitors of philanthropic organizations are often in a position analogous to that of the nurse in giving personal instruction to those exhibiting cancer symptoms. In this manner many people can be reached who would be unlikely to read the papers or educational literature. Our Committee will be delighted to coöperate with them.

Educational Campaign Among the Laity.—Our Committee will join hands with the State Committee on Cancer Control, appointed by the American Society for the Control of Cancer, whose Chairman is Dr. Jos. Ransohoff of Cincinnati. His Committee is in charge of the dissemination of knowledge among the laity.

The ways of coming into contact with the public are, of course, manifold. Lectures will be given to women's clubs and to all organizations where great gatherings of individuals take place, as business meetings, clubs of various sorts, etc. The most efficient way, however, to come into contact with the public is the newspaper. Their assistance will be sought to spread knowledge of the cancer problem. This must be done in a dignified but persistent way. Although the message of cancer control has nothing spectacular, we hope to secure the coöperation of the newspapers. It is true that cancer propaganda will not fulfill Dana's requirements for news. He said that "if a dog bites a man, that is no news and we do not want it; but if a man bites a dog, that is news, and we do want it." In our case it is not a dog biting a man, but a much more formidable enemy, *cancer*. Unfortunately, there is nothing new in the statement that it does so, but the true news is that this bite can be often prevented and often cured, provided early recognition and adequate treatment are resorted to.

TUMORS OF THE BREAST, BASED ON A STUDY OF SEVENTY-SEVEN CASES PERSONALLY OBSERVED.

BY

MILES F. PORTER, M. D., F. A. C. S.,

Fort Wayne, Ind.

THE present study is based upon all of the cases of tumor of the breast that have come under my observation since November, 1905, except a few cases, perhaps twenty-five or less, that were operated upon either in private homes, or outside hospitals, or under other circumstances which rendered the keeping of anything like adequate reports impossible.

Of the 77 cases reported, 49 were malignant and 28 were benign. The types of malignancy observed with the number of each type were as follows: adenocarcinoma, 7; scirrhus carcinoma, 17; duct cancer, 4; lymphosarcoma, 1; gland cell carcinoma, 1; squamous carcinoma, 2; medullary carcinoma, 2; metastatic carcinoma, 1; cylindric carcinoma, 2; not classified, 12.

To correctly classify carcinoma microscopically necessitates, as has been pointed out by Deaver and others, a large number of sections, and had this procedure been carried out in all cases above reported, it is not at all unlikely that the classification might have differed considerably from the one given.

Inasmuch as the predominating type of cancer in this group of cases supports the generally accepted view that the majority of cases of cancer of the breast met with would be classed clinically as belonging to the scirrhus type, I think it may be said that it represents fairly accurately the relative frequency of the occurrence of the different types. It is of course well recognized that the results of the microscopic study of tumors do not correspond with those obtained from the clinical study of the same cases. It is important that the two methods of study be combined whenever possible.

No composite tumors were found in this group. In one case, from an examination of a frozen section there came back the report —"sarcoma." and in another the report came back—"non-malignant." Further study in these cases proved them both to be carcinoma of the scirrhus type. Experiences similar to the above

are not uncommon and emphasize the necessity of examining numerous sections in a certain percentage of cases before making the diagnosis. I have for long made it a rule to do a radical operation in all cases in which the report on frozen section comes back as malignant, but in cases where in the clinical examination of the case leads to the conclusion that the trouble is malignant, a radical operation is likewise done, even tough the report on the frozen section comes back—"benign."

In 11 of the cases there was, in addition to the tumor present, either depression of the nipple, ulcers of the skin, or fluid discharging from the breast. The fluid discharge was in some cases colorless and in others, bloody. The character of the discharge does not indicate the character of the growth, so far as the question of malignancy is concerned. One may have either a bloody or a clear discharge from the nipple in either benign or malignant trouble. Discharge from the nipple does indicate, however, that the pathologic change is within the duct. In 2 of the cases reported in this series, a discharge from the nipple was the only sign of trouble present. There was no tumor. One of these 2 cases proved to be malignant and the other, non-malignant. The fact that a discharge from the nipple may be the only sign of cancer demands emphasis.

The youngest patient in this group was seventeen years of age, female, unmarried. She had a duct cancer. The breast and the fascia underlying it only were removed in 1908. She is married and living at the present writing, but whether or not there are any signs of a return of the trouble, I cannot say inasmuch as I have been unable to get into communication with her. This patient stated that the growth started immediately after an injury received two years prior to her visit to me. This case is of partiular interest first, because of the age; second, because of the length of time (two years) that elapsed after the appearance of the tumor before she consulted a surgeon; third, because of the appparent permanence of the cure, following the simple removal of the breast and underlying fascia.

The oldest patient was seventy-one. She had a scirrhus carcinoma. One benign tumor, neurofibroma, occurred in a woman sixty years of age. The youngest patient with a benign tumor was a female of twenty-two years. In 885 cases of tumor of the breast, Bloodgood(1) found only one cancer occurring in a patient under twenty-five. This patient was twenty-one. Thompson (2) removed an adenocarcinoma from the left breast of an eleven-year-old girl.

Battle and Maburg (*loc. cit.*) report an epithelioma of the nipple in a girl of eleven years. Brewer (*loc cit.*) of New York removed from the breast of a sixteen-year-old negress an intracanalicular adeno-papilloma undergoing malignant transformation. So far as I have been able to learn the above are the only cases reported in as young a patient as mine.

Thirty-three of the women had nursed children and of these, twenty-five had malignant tumors. Of the forty-two women who had tumors of the breast and who had not nursed children, only nineteen had malignant tumors. Fifty-seven of these patients were married. The important point in the history of a woman with tumor is not whether she is married or unmarried, but whether she has ever been pregnant and especially whether she has nursed children or not. It does seem from my experience, and this experience I think accords with that of other surgeons, that nursing is one of the causes of cancer of the breast, and, on the other hand, that the married state in and of itself may not be said to be in any sense a cause of cancer of the breast. It is because and only because the married state increases the incidence of pregnancy that it may be said to be a contributing factor in the production of cancer of the breast.

Of the women over fifteen years of age in my state (Indiana), 65 per cent. are either married, widowed, or divorced. In my series of cases, 75 per cent. of the malignant tumors of the breast occurred in married women and the same percentage of cases occurred in women who had nursed children while only 24 per cent. occurred in single women and 43 per cent. in women who had not nursed children. It will be noticed also that in this series of cases, nine followed infection and seven injury of the breast. Taking all the facts into consideration, it seems that we are forced to the conclusion that the changes in the breast incident to pregnancy enhance the likelihood of the occurrence of cancer and that, if there is added to these changes additional sources of irritation, etc., which come from nursing, the likelihood of the occurrence of cancer will be still further increased. I am forced by the facts to disagree with Deaver when he says(3) "married women are proportionately less liable to develop cancer of the breast than unmarried women."

In forty-nine malignant cases in this report, there were nine cases in which there was a history of preceding infection of the breast, and seven cases in which there was history of an injury. In this connection, the case of Mrs. H. T. is of particular interest. She came to me thirty-four years after having had an abscess of the

breast, which abscess was lanced. Immediately following the lancing of the abscess, a lump appeared and remained. I found that she had a scirrhus carcinoma of the breast, involving the axillary glands. A radical operation was done in 1913. Three years later a recurrent nodule was removed. This spring she reports herself in good health, but says she has had an irritating skin disease on her arm ever since the operation. There is no return of the cancer.

Concerning the character of the operations done in these cases, we find that in nine the tumor only was excised. There was a return of the trouble in one of these patients six years later, at which time a radical operation was done. The woman is now (four years later) well, with no sign of a recurrence. It might be well to add that this recurrence was at the site of the previous operation, which was in the anterior axillary line, and was noted about one and one-half or two years before she came to consult me about it. The reason for doing a simple excision in this case was because of the fact that the woman reported that the trouble commenced with a red spot on the skin, which had followed the grippe and which appeared about a year prior to her visit to me, and because on examination I concluded that the trouble was probably infectious in character. A frozen section was not made; but, as the laboratory report received later showed "early scirrhus carcinoma," I thought it just as well to postpone radical operation until there was some sign of the return of the trouble, for which I told the patient to keep a careful watch. What should have been done with this patient, in my judgment, at the primary operation was a total removal of the breast and axillary glands. I shall refer to the question of the extent and character of the operation later on.

In forty-two cases a primary radical operation was done. In fourteen cases a radical operation was done, following an excision of the tumor and an examination of a frozen section. In twelve cases the gland only was excised. In only a little more than 50 per cent. of the malignant cases was an immediate radical operation regarded as necessary.

The shortest time that elapsed after the trouble was first noticed until a doctor was consulted was four days. This proved to be a fibrous tumor, which was removed nine years ago, and the woman is now in perfect health. The longest time intervening between the first symptoms and the visit to the surgeon was thirty-four years. This was the case of Mrs. H. T. reported above.

In this series there were two cases occurring in males. In both

the tumors were benign. This corresponds very closely with Schuchardt's finding, which was that about 2 per cent. of all neoplasms of the breast were found in men. The combined tables of Primrose, Judd, and Deaver, as compiled by the latter, show that 88 per cent. of the cancers of the breast occur in males.

Only four of the cases reported in this series had coexisting maladies. One of these had a fibroid tumor which was removed some months after the radical operation for carcinoma of the breast. In another patient, a round ligament operation for retroflexion was done at the same time the breast was operated upon. In still another case, a hemorrhoidectomy was done. Both the latter patients had benign tumors. In one patient the breast was removed for what proved to be benign tumor, two years after hysterectomy for carcinoma. The tumor in this case appeared six months before the hysterectomy was done.

Of 22 cases of cancer from which we have later reports, thirteen had involvement of the axillary glands at the time of the operation. Of these four are living and well after five years or more—30 per cent.; three, after three years or more—23 per cent.; four, less than three years. One had a recurrence and one is dead. There are seven cases in which no gland involvement was found. Of these two are living and well after five years or more; and the remaining five are living and well but are within the three year period. One of these cases, reported as well in the three year period, is that of Mrs. H. T. above reported, who had a secondary operation for a recurrent nodule, in the spring of 1916. Of the patients who are dead, two had both metastatic and local return of the trouble. Six had no local return but metastasis only: one to the liver, one to the stomach and bowels, one to the lungs, two to the brain, and one died of metastasis involving the upper end of the femur, the upper part of the cord, and the brain (three in eight went to the brain).

The diagnosis in all these cases, save two, was confirmed by laboratory examination.

In the 16 benign cases of which we have later reports, there has been no return of the trouble except in Mrs. L. who reports that she has had a lump in the arm pit for six months. The laboratory report on this specimen was benign adenoma. The tumor only was removed. I have not been able to see the woman and cannot say whether this means that there was a mistake in the diagnosis at the time or just what the correct explanation of the lump in the axilla is.

There was no operation mortality. In this series we have had in all six cases that have passed the five year period. This gives us

27.2 per cent. of five-year cures, and 13.6 per cent. of three-year cures. It will be remembered that we had 30 per cent. of five-year cures in the 13 cases that had axillary involvement at the time of operation, 2.8 more five-year cures than is shown in the whole series including those who had no axillary involvement. This, I take it, is only one of those vagaries with which one sometimes meets in the study of statistics, and in no wise contradicts the fact that axillary involvement adds to the gravity of the prognosis. However, it does emphasize the fact that not all nodes in the axilla of a patient with breast cancer are cancerous. It should be said in this connection that all of the patients were benefited by the operation, including even those who later died of the trouble. In my opinion the benefit derived from the operation on these late cases was in a material measure mental; that is to say, the knowledge that the growth was removed gave them mental relief for a time, even though later there was a return.

It has been well established says Benedict(4) "that heredity plays no notable part in cancer." I cannot subscribe to this opinion. While I have not gone over all my cancer cases with a view to a study of this question of heredity, I have a very strong impression from my experience with cancer in general that we are at present underestimating the importance of the part which heredity plays in the production of cancer. The following is one of the most impressive cases that have come under my observation:

Miss M. T. R., aged forty-three, single, physician, was operated by me for cancer of the uterus in 1913. Her family history is as follows:—Mother died of cancer of the rectum. Two brothers died of cancer, one of the cecum and one of the rectum. One maternal aunt died of cancer of the uterus; one maternal uncle died of cancer of the rectum; one maternal great-aunt died of abdominal cancer; one maternal great-uncle died of cancer of the colon; one maternal second cousin died of cancer of the stomach and another of cancer of the bowel; another maternal second cousin was recently operated for a cancer of the uterus.

The experiments made at Harvard with mice seem to show that in those animals one can breed either immunity or susceptibility. Moreover, it is illogical to assume that heredity plays an insignificant part in the production of cancer in man in the light of the well-established facts concerning the breeding of forms, color, and character in the lower animals.

In a paper made before this body seven years ago(5) I said: "All demonstrable cancers require radical removal." My opinion in this regard has been changed. I do not think it advisable to remove

the breast muscles and axillary glands in very early cancers wherein the pathology seems distinctly circumscribed. In cases of this kind I have for several years contented myself with removal of the whole mammary gland. These cases are probably those that MacCarty puts in the class of secondary cytoplasia. He says(6) "At the time of preliminary investigation I had confidence in the old criterion for histologic malignancy which utilizes the basement membrane (membrana propria) as the line of demarcation between a malignant and a benign condition; the cells of secondary cytoplasia are within the histologic bounds of benignancy despite the fact that they are morphologically identical with those of carcinoma. From a clinical or practical standpoint, I have been convinced that all mammary gland-bearing tissue presenting such a picture should be removed, leaving, perhaps, the pectoral muscles and axillary lymphatic glands. I have not felt justified in advising the removal of the breast, muscles, and axillary glands by means of a radical operation. Rules have been established on this basis and subsequent postoperative histories have justified, so far, the legitimacy of such a conservative operation." Regarding the particular type of operation done, whether it be a radical operation or simple excision, it is better to choose the operation to fit the case than to make the case fit the operation.

In closing let me say that our only hope of improving the results in the treatment of cancer lies in earlier operation. In the Baltimore clinic, according to Bloodgood(7) the proportion of benign to malignant tumors of the breast has increased 27 per cent. in the last twenty-seven years. Bloodgood accounts for this fact on the ground that the public and the profession are better educated as to the importance of early removal of tumors. It is quite generally conceded, I think, that surgeons see these cases much earlier on the average now than in former years. That this is true is due in a small measure to the efforts of the American Society for Control of Cancer. This society should receive the hearty co-operation of the whole medical profession.

REFERENCES.

1. Binnie. Regional Surgery, Vol. I, p. 558.
2. Deaver & McFarland. Anomalies and Diseases of the Breast, p. 514.
3. Anomalies and Diseases of the Breast, p. 524.
4. *American Journal Medical Science*, vol. clvii, 1919, p. 749.
5. *Transactions A. A. O. and G.*, vol. xxv, 1912, p. 222.
6. *American Journal Medical Science*, vol. clvii, 1919, p 663
7. Binnie. Treatise on Regional Surgery, p. 562.

DISCUSSION ON THE PAPERS OF DRS. GILLETTE, CROTTI, AND MILES F. PORTER.

Dr. Roland E. Skeel, Cleveland, Ohio.—These papers have opened up the most important subject of the afternoon, and I wish to emphasize what Dr. Porter has said about the great importance of patients presenting themselves early for the diagnosis of cancer. The fact that some patients come earlier than formerly is due to a more general dissemination of knowledge among the public in regard to cancer and the efforts of various societies devoted to the study and control of cancer. This is particularly true of cancer of the breast, but it does not hold true of cancer of the cervix because patients with cancer of the cervix consult physicians just as late as ever. Women with tumors of the breast are realizing the importance of securing medical aid faster than are the family practitioners.

Only a short time ago a patient came into my office who had had a tumor of the breast for four years, but her physician had advised her to wait. This tumor proved not only to be a carcinoma, but in addition there was marked involvement of the axillary glands. I had said to her that this tumor might become a cancer, if it was not already so, but she said she had not known it was likely to pass from the benign to the cancerous stage and was advised to wait.

My personal attitude toward cancer is extremely radical. I look upon adenomas of the breast, myxomata, and so on, as potentially malignant. I feel there is not a tumor in the body, aside from possibly the lipomata, which does not demand extirpation without any question because of the possibility of the development of carcinoma. I consider it one of the most important questions before the profession, and added to this is the great necessity of educating the general practitioner to the idea that a woman who has a lump in her breast, or who flows freely, or "spots" at the menopause, either has a cancer or is a definite candidate for a cancer. If every woman with a small lump in the breast could be induced to undergo an early operation for its removal, much good might be accomplished. Again, women, having a bloody discharge after the menopause should not be allowed to believe they are having a renewal of menstruation, but should have impressed upon them the possibility that bleeding is indicative of cancer. If they are educated along this line the public will gain much in the prophylaxis of cancer.

Dr. Bertha Van Hoosen, Chicago, Illinois (by invitation). Last year, I think perhaps some of you may remember, I reported some cases of carcinoma that had been treated with emetin hydrochlorid. I told you at that time I had been working for four years treating carcinoma with emetin from the standpoint that it was produced by protozoa. My effort has been since that time, as it was before, to try and give the patient a large enough dose of emetin hydrochlorid so that we would not injure the patient but get rid of the disease locally without surgery, and I received considerable encouragement last year. Since then I have received a great deal of encouragement.

I can report eleven cases that I consider cured. Four were early cases, and these did not have a microscopic diagnosis. They only had this spectacular thing happen to them: A lump as big as your fist disappeared in the course of two weeks. You can take that for what it is worth. The other cases were diagnosed microscopically. Of those cases which were too far advanced to warrant operation, I have one case of carcinoma of the rectum, one case of carcinoma of the labia, two cases of carcinoma of the fundus uteri, one case of recurrent carcinoma of the cervix, and one case of carcinoma of the cervix. This one case of carcinoma of the cervix I shall be glad to tell you about, because I consider it by far the greatest and best result I have had, and I believe there has never been a result obtained in the treatment of cancer by radium or anything else that will compare with it.

This patient went to Dr. Fitch, of Chicago, because she had passed the menopause and had started to menstruate again and had been menstruating every day from the first of January to the first of May. He removed a specimen for diagnosis and found it to be carcinoma. He told her to go to the Presbyterian Hospital and have radium treatment, or to undergo an operation if they thought it was necessary. He did not think they could do it. He wanted her to go the next day, but she went to another general practitioner, a graduate of Northwestern University, a man who is held in high esteem, Dr. P. T. Burns. He advised her to go to the Mary Thompson Hospital for treatment in which he had confidence. We took a specimen from the cervix, examined it, and it proved to be carcinoma. It was not possible to feel the cervix; the vagina was ulcerated in every direction, especially toward the right fornix. (Time called.)

Dr. Miles F. Porter (closing the discussion).—I would like to ask a question. How many hundreds, perhaps thousands, of appendicitis cases have we buried because we refused to hurt the family physician by telling the friends of the deceased patient that the only reason why the patient did not get well was because they delayed? Now, I do not like to hurt the feelings of my fellow practitioners, but I have come to the point with cancer, as I did with the appendicitis question, that when a patient comes to me with a cancer that has been going on for a considerable time and she has been told by the family practitioner to let it alone, I feel she has a right to what I believe to be the truth, namely, that she might have been cured had her doctor told her the right thing years ago. We will never get these cases early unless we stop protecting too far a lack of knowledge on part of the general practitioner. We must be honest and frank with our patients; we are responsible to them, and after having shouldered that responsibility we must do our duty.

THE VARIETIES AND TREATMENT OF DYSMENORRHEA.

BY

J. HENRY CARSTENS, M. D.,

Detroit, Michigan.

It is but natural that people look upon trouble of various kinds as due to mechanical causes; hence the profession has that same view. In dysmenorrhea the physician thinks first of some mechanical cause, some obstruction; and on investigation, especially in young unmarried women, a mechanical cause is found in many cases. It may be a very small os, or the uterine canal may be obstructed either by contraction or, perhaps, kinking of the uterus. The profession soon learned that by opening, dilating, and straightening the uterine canal, they were able to relieve many of these cases. The embarrassment of an examination to the young woman, however, has made the profession reluctant to make a thorough physical examination; hence many cases are first treated with remedies of various kinds to relieve this condition. I have tried all kinds of drugs, and must confess that I never found any medicine that would *cure* a case of this kind. The long list of remedies for the relief of dysmenorrhea recommended in the pharmacopia are of no value. The only remedy I found that, sometimes, relieves these cases is two grains of ergotine, in pill form, one pill three times a day. The use of this drug must be persisted in for several months. There are, of course, anodynes which, if given at the time of the pain, will relieve the patient; but at the next period something will have to be given again, and so on for months and years. Our own member, Litzenberg, has lately highly recommended benzyl benzoate to relieve painful menstruation.

I still hear the following advice given by many physicians to young girls, or to their mothers: "If she gets married, and has a baby, her trouble will cease." This is perfectly true, but the only difficulty is that these young women do not have babies. They are sterile. They really *should not be allowed to marry* until they have been permanently relieved of the existing dysmenorrhea. Dilatation of the cervical canal relieves many cases, at least temporarily. For one or two periods the patient seem to have recovered; then gradually the trouble recurs on account of recontraction of the uterus. Thirty-five years ago, I wrote an article on the mechanical thera-

peutics of dysmenorrhea, advocating dilatation of the uterus, with a small Notts dilator, just before the menstrual period. When this treatment was continued for six months or more, many of these cases were cured; and, in the meantime, some became pregnant. This method of dilating the uterus may be done in the office without an anesthetic; but as it is painful, many patients refuse to continue the treatment.

Later I began to use stem-pessaries; cautiously at first, but gradually I became more confident in their efficacy, and then strongly advocated the use of the stem-pessary for the relief of dysmenorrhea. By the introduction of this instrument the uterus is kept straight and open, and after it has been left in situ for four or five months, a new adjustment has taken place, and the uterus remains patulous. I have tried various kinds of pessaries, but the Chalmers gave the best results. As the pessary is made of rubber, the heat of the body softens the instrument, its two arms then come together, and the pessary often drops out of the uterus.

I then tried various metal stem-pessaries; but they corroded, more or less. Finally I had them made of pure silver and shaped like the Chalmers instrument. They are elastic, of different sizes, and can be shaped to fit different cases; and, what is more, these pessaries are not only aseptic, but absolutely antiseptic; a little oxidation takes place, and this disinfects the uterine canal. I have seen chronic cervical endometritis cured by the introduction of a silver stem-pessary.

Flexion of the uterus produces obstruction. In many of these cases the introduction of a stem-pessary, in addition to a retroversion pessary, to be worn for six months, will enable the weak uterine ligaments to regain their tone, if proper hygienic treatment is given at the same time. In some of these cases, of course, it is necessary to perform an Alexander or a Gilliam operation, or some modification thereof, before permanent relief is obtained. The best all-around treatment is physical exercise. Country girls do not, as a rule, suffer from dysmenorrhea.

There is another variety of dysmenorrhea. Many of our people have come from foreign shores, and from the different nations of the world. In a short time they develop the one mental attitude called ambition. Many of the young girls of foreign birth, whose fathers were men of the hoe, have the ambition to become teachers, stenographers, or bookkeepers, but they do not possess the necessary mental caliber. It is difficult for them to learn, but they keep on trying and study hard. They go through high school, business college,

or normal school with great difficulty, and only by prolonged and constant mental application and physical strain. They work hard, often until the late hours of the night, poring over their books. As these studies take place at the very period of the development of the sexual organs, something must suffer. In most of these cases we find scant and painful menstruation as the result of an infantile uterus. Occasionally the whole uterus is only an inch or a little more in length. Now and then the cervix is of normal length, but thin like an ordinary lead pencil, while the fundus of the uterus is less than an inch in size. Now in these cases a careful dilatation and the insertion of a stem-pessary will develop the uterus to normal in the course of six months or a year; and, I believe, the ovaries and tubes are also stimulated to further growth by the presence of the stem-pessary in the uterus. Let this suffice for the mechanical side of the subject.

There are rare cases where the mucous membrane of the uterus is cast off, and the pain is excruciating until it is expelled. In these cases I have found that dilation of the cervix and swabbing of the uterus with carbolic acid bring about a cure. I have also seen cases in which a silver stem-pessary has given relief.

What I have said so far refers to the uterus alone, and my statements are made on the assumption that absolutely no other diseased condition is present. The profession soon discovered that the uterus was apparently normal but that dysnmenorrhea still existed, notwithstanding. In some of these cases pain is present on both sides, and it was but natural to assume that the ovaries were responsible for the suffering; hence ovarian dysmenorrhea. In cases where the pain was intense and could not be relieved after long and repeated trials, and when life was made miserable and really unbearable, Batty advocated the removal of the ovaries—"normal ovariotomy." Naturally, this operation absolutely stopped mentruation. The patient was cured, but unsexed at the same time.

This was the beginning of *modern abdominal surgery*, because gynecologists found that the abdomen could be opened, and that every patient so treated would not die. That was in 1873, at the same time when Lister advocated his antiseptic treatment of wounds. Soon thereafter ovaries were generally removed, and, I am sorry to say, that even to-day the removal of the ovaries is often advocated and practiced when there is really no disease in these organs. I have met with only one kind of ovarian dysmenorrhea, and that is caused by the cirrhotic ovary, an ovary shriveled, contracted, and hard. I think that in some of these cases there may be, in the interior of

such an ovary, a Graafian follicle which cannot enlarge or rupture because it is firmly grasped and surrounded by hard cirrhotic tissue, and thus pain is produced. Fortunately, in my experience, only one ovary is involved, and the patient can be relieved by its removal.

But the profession soon recognized that many of these cases of so-called ovarian dysmenorrhea were accompanied by an inflammatory condition in the pelvis, so that another class was added—that of inflammatory dysmenorrhea. Lawson Tait was the one who taught us what this form generally meant pus-tubes, and infection of some kind. In most cases the ovaries are not involved at all, except on account of displacements or adhesions. By careful physical examination we can detect the enlarged, swollen, and tender tubes, and from the history of the case we usually know what kind of infection has taken place. About one-half of these cases are of gonorrheal origin. Most of the others are due to puerperal causes, more especially following in the wake of miscarriages and abortions. A small percentage of these cases are caused by tubercular, pneumococcus, or some other kind of infection.

In this category belongs, I think, ordinary pelvic adhesions, caused by a colon infection. These adhesions produce little trouble; but when the menstrual congestion takes place, the weight of the congested uterus, tubes, and ovaries will pull on these adhesions and cause pain.

The inflammatory dysmenorrhea and pus-tube variety of painful menstruation also require mechanical treatment; and although these cases are frequently relieved for a time, they recur repeatedly and finally required operative interference to obtain permanent relief. It is the rarest thing forthe *vix medicatrix naturæ* to cure such a case permanently; and the character of the operation will depend upon existing conditions. Sometimes the tubes must be removed completely and the uterine end permanently closed. In some cases a part of the tube is left patulous, so that pregnancy may take place. As a rule, the ovaries are not involved at all; and when they are stripped of adhesions, they appear perfectly normal, and should be left alone. If an abscess also has formed in the ovary, it must be removed with the tubes; but every effort should be made to save at least one ovary, or a part of one.

Finally, we have cases of painful menstruation where all the pelvic organs seem to be in perfect condition, and where absolutely no cause can be found for the dysmenorrhea. As in many other painful conditions, the cause remains unknown. Thus a fifth variety was added to the disorders of menstruation, the so-called neurologic

form of dysmenorrhea. Naturally, this means nothing. All kinds of causes were assigned, until at last some light was thrown on the question through the study of the ductless glands, and it has been decided that disturbance of one or more of the glands was generally the cause of this kind of dysmenorrhea. But the thing is so intricate that we are still groping in the dark.

Overactivty of the pituitary gland, as well as underactivity of the thyroid, is blamed for dysmenorrhea, to say nothing about the lack of ovarian secretion. Premenstrual pain and dysmenorhea are said to be caused by overactivity of the corpus luteum. An early retrogression of the thymus causes hyperplastic ovaries.

It would take too long to go exhaustively into this question, as very little has been discovered. One of our difficulties is the lack of standardization of the various preparations of the ductless glands. When we can get the really active principle of all the ductless glands, as we do of the adrenal, we shall soon make headway. But the preparation of the different manufacturers varys, and often there is a variation in the efficiency of the preparations of the same manufacturers. Cattle from which the glands are taken vary much; some are young, and some old. All this makes a difference, although I am informed that an effort is made to obtain the glands from cattle in full sexual vigor.

Virtually, all attempts to relieve these cases are an experiment. In some cases the administration of thyroid seems to do good, while in the next one it seems to do harm. Corpus luteum extract is of value in some cases, and again in others absolutely no benefit is derived from its use. Thymus extract relieves some cases, and a good deal of benefit seems to be derived, occasionally, from placental extract. X-ray treatment has been used for ovarian dysmenorrhea, but I would warn *against this strongly*, as at present we cannot gage the treatment accurately.

This subject seems to me of sufficient importance for a symposium at some future meeting. Perhaps we might clear up some of the moot questions involved.

Résumé.—1. Dysmenorrhea is due to obstruction, or abnormal conditions of the uterine mucous membrane, or inflammation of the tubes, or pelvic adhesions, or an aberrant action of one or more of the ductless glands. 2. The treatment consists of dilatation of the cervix, and the use of the stem-pessary to give permanent relief, if possible; or of abdominal section for the removal of the tubes, or the restoration of them, and the breaking up of adhesions; or of the use of preparations of ductless glands.

CONGENITAL ABSENCE OF THE GALL-BLADDER REPORT OF A CASE.

BY

GASTON TORRANCE, M. D.,

Birmingham, Alabama.

THE gall-bladder is normally absent in the ass, horse, elephant, rhinoceros, and some fishes. To find it absent in man, however, is a very rare condition. Moynihan says: "Complete absence in man, though rare, is nevertheless well authenticated." A case is briefly mentioned by Latham, and a specimen was shown by Thursfield before the Pathological Society of London, in April, 1903. There are five or six specimens of this kind in the museums of the various London hospitals.

Specimen No. 1400, in the London Hospital Museum, shows absence of the gall-bladder; there were several ducts discharging bile into the duodenum. When the gall-bladder is absent, it is constantly found that the common bile-duct is dilated; or, as in the case just mentioned, multiple ducts may be present.

In at least 25 per cent. of all the recorded cases there have been associated with this abnormality gross deformities of the liver—absence of a lobe, median constriction, etc. The fossa of the gall-bladder is, of course, in such circumstances always absent.

Absence of the gall-bladder and bile-ducts: Three cases are recorded of complete absence of all parts of the biliary apparatus outside of the liver. Moynihan shows drawings of a case reproduced from the description of a case reported by Kirmisson and Herbert. These drawings show the upper and under surface of the liver of a child one month old who died of septicemia resulting from a wound in the chest. Jaundice was noticed on the third day. The upper surface of the liver is seen to be divided into two lobes by a deep fissure into which the umbilical vein enters. The under-surface shows no evidence of the gall-bladder or of any ducts—hepatic, cystic, or common ducts. The portal vein and hepatic artery alone are seen. The closest examination of the gastro-hepatic omentum was made, but no ducts were found. An examination of the duodenum revealed no trace of any opening of a bile-duct. The microscopic examination of the liver was made by Professor Cornil.

Two other cases of complete absence of the extrahepatic biliary apparatus are recorded by Pozzi and Porak (Moynihan). Mayo-Robson mentions five specimens of absent gall-bladder: one specimen, No. 1390, in Guy's Hospital museum; one at St. Thomas' Hospital; two at the museum of the Middlesex Hospital, and specimen No. 1391, in the Royal College of Surgeons' Museum. Harle mentions the case of a man of fifty years of age in whom he could find no gall-bladder. Patterson reports a case of a man twenty-five years old in whom no evidence of a gall-bladder could be found.

Report of case: A farmer, thirty-eight years of age, was referred to me in January of the present year. He was suffering from chronic appendicitis and a mass in the right breast, and had been in bad health and unable to work for three years. His digestion was poor; he was unable to eat solid food, and had been living on raw eggs and milk. He suffered from gas accumulations, sour stomach and constipation. The mass in the breast he had noticed for three years, and believed that it was caused while he was making axe handles, resting the timber against his chest in dressing it down. This mass proved to be a cold abscess.

The physical examination proved negative, except for some tenderness over the appendix. A right rectus incision was made, and, after removing the appendix, I decided to examine the gall-bladder. Sweeping the hand up under the liver, I could not feel the viscus. The liver was drawn up well into the incision, where a thorough search could be made; its under-surface was perfectly smooth, and no evidence of any thickening or anything suggestive of an intrahepatic gall-bladder could be found. There was no indication of an enlargement or duplication of the common duct as suggested by Moynihan. The patient made a good recovery and has been very much improved by the operation. He is now able to do some farm work.

REFERENCES.

Moynihan. Gallstones and Their Surgical Treatment, Saunders, 1905.

Latham. *Journal of Anatomy & Physiology*, London, 1898.

Kermisson & Herbert. Bull. et Mem. de la Soc. Anat. de Paris, March, 1903.

Mayo-Robson. Diseases of the Gall-bladder and Bile-ducts, 1904, Bailliere, Tindal, and Cox, London.

Harle. *London Lancet*, 1856, vol. ii, p. 304.

Patterson. Medical Times & Gazette, London, 1864, vol. ii, p. 476.

THE CAUSAL RELATIONSHIP OF MYOMATA TO CARCINOMATA OF THE CORPUS UTERI.

BY

H. W. HEWITT, M. D.,

Detroit, Michigan.

(With four illustrations.)

MUCH disagreement exists to-day in the profession regarding the causal relationship of myomata to carcinomata of the corpus uteri. Some writers agree with Bland-Sutton, (1) that the occurrence of myomata and carcinomata in the same uterus is a mere coincidence. Many believe with Crossen, (2) Noble,(3) Péquand, (7) Winter(6) *et al.*, that myomata predispose to carcinomata, and cause the interference with the circulation or the chronic irritation or the pressure changes in the uterine mucous membrane necessary to the development of carcinomata.

Compiled statistics reveal the fact that the usual ratio of the occurence of carcinoma of the cervix to carcinoma of the corpus is variously estimated, in uncomplicated cases, as from 40 to 1, to 4 to 1. Williams(4) estimates the incidence at 40 to 1, Cullen (5) at 4 to 1, Winter(6) at 15 to 1, Noble(3) at 10 to 1. It would appear that an average ratio would be 15 to 1.

Winter(6) studied 1607 consecutive cases of myomata from his own clinics and those of Hoffmeyer and Fehling, in which there were 20 carcinomata of the corpus uteri, or 1.2 per cent.; moreover, he examined 1270 cases of myomata from the clinics of Hoffmeyer, Freund, and Winter, in which there were twenty-five cases of carcinoma of the cervix, or 2 per cent. In Kelly's clinic, Johns Hopkins Hospital, in 999 cases of myomatous tumors of the uterus, cancer of the cervix was found in sixteen instances, and cancer of the corpus in twelve. Noble(3) collected from the literature 4880 cases of fibroid tumors of the uterus, in which were found sixty-three cases of carcinoma of the cervix, or 1.29 per cent. and 75 cases of carcinoma of the corpus, or 1.54 per cent., making a total, of both corpus and cervix, of 2.8 per cent. It is highly probable that, had all these uteri been subjected to careful microscopic examination, a much larger percentage of cancer would have been found. Péquand(7)

concluded from a study of the literature that cancer of the corpus uteri is 8 to 9 times more frequent in women having fibroid tumors than in those without this pathological condition, and that fibromyomata predispose not only to the development of cancer of the corpus, but to cancer of the cervix as well. He states, further, that primary carcinoma developing in the midst of a myoma, is possible but rare. He has collected twenty-four such cases. He explains this development on the ground that there has been an inclusion of the uterine mucosa, which has grown into the tumor, and from which has developed a primary carcinoma.

Klein,(8) in a study of 200 operated patients, reports that a complication, either of sarcoma or carcinoma of the uterus, existed in 10 instances, or 4.85 per cent. Winter(6) commits himself to the view that there is a distinct connection between myomata and carcinomata of the corpus, and that the carcinoma probably results from the hyperplastic condition of the endometrium existing in consequence of the myoma. Noble,(3) in his study of 4880 consecutive cases of fibroid tumor of the uterus in a relation to cancer of this organ, states "that the conclusion seems inevitable that fibroid tumors of the uterus predispose to the development of cancer of the corpus uteri. Were this not true, with seventy-five cases of cancer of the corpus existing in this series, 750 cases of cancer of the cervix should have been found on an average calculation; even taking the minimum estimate of Cullen's, which is 4 to 1, there should have been 300 cases of cancer of the cervix, whereas but 68 were present. To explain this as an accidental circumstance in such a large series of cases, would be an assumption so far-fetched as to be beyond reasonable doubt. It is my opinion that when this subject is studied in the future and the presence or absence of fibroid tumors, no matter how small they may be, is recorded in connection with all operations on the uterus, when cancer exists in that organ, the data secured will offer stronger evidence than is true of this particular series in which the number of cancers given is far below the actual number, because of the influence of statistics in bringing about the failure to record the presence of a fibroid because of its supposed relative unimportance when complicating cancer."

It is true that myomata of the uterus occurs more frequently in spinsters between the ages of thirty and fifty than in women who have borne children. It is also true that carcinomata of the corpus develop in unmarried women just as frequently as in women who have borne children; while, on the other hand, carcinomata of the cervix in barren women is almost unknown. Carcinomata

of the cervix occur almost exclusively in multiparæ, or in women in whom the cervix uteri has been lacerated or injured.

REPORT OF TWO CASES.

In a series of 100 fibroid uteri removed by the writer, there occurred two cases showing carcinomata of the corpus; one rather advanced; and the other a very early case, which was not diagnosticated before operation, although carcinoma was suspected. In this series two cases of carcinoma of the cervix were also found.

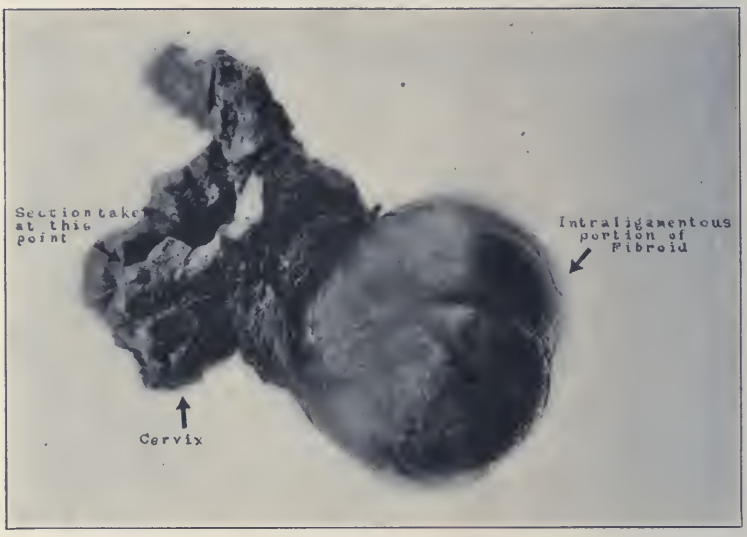


FIG. 1.

CASE I.—Mrs A. R., first seen on March 13, 1917. Aged fifty-five. Father died at sixty-five of carcinoma of the stomach; mother died at seventy-five the cause of her death unknown; four brothers are living and well. No history of tuberculosis in the family. Past personal history revealed only some of the diseases of childhood. Menstruation began at fourteen, always regular, at intervals of twenty-eight days. Menopause, uneventful at fifty-two.

History of present illness: Six years ago, at the age of fifty, patient noticed a small tumor in the lower part of her abdomen. This tumor gradually increased in size, but caused her no pain or discomfort. In July, 1916, she had a uterine hemorrhage, lasting about three weeks. This was followed by a very offensive leucorrheal discharge. From July, 1916, until March, 1917, there was an occasional uterine hemorrhage of from two to ten days duration. She had lost about 10 pounds in weight in the past eight months. On abdominal palpation a large solid tumor in the lower abdomen could easily be mapped out (Fig. 1); on bimanual examination it was ascertained that this tumor involved the uterus and extended into

the left broad ligament; an examination with the speculum did not disclose any evidence of cervical carcinoma.

Examination of the blood: Coagulation time, 5 min.; hemoglobin, 65 per cent.; erythrocytes, 4,300,000; leucocytes, 18,000; polymorphonuclears, 75 per cent.; eosinophiles, 2.5 per cent.; small mononuclears, 11 per cent.; large mononuclears, 11.5 per cent. Urine negative.

Diagnosis.—Degenerating myoma, or a myoma complicated by carcinoma of the corpus uteri. Radical hysterectomy was advised and performed on March 19, 1917.

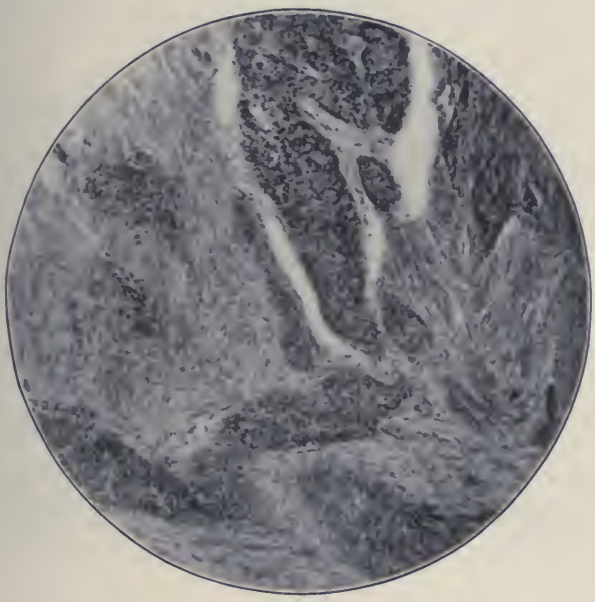


FIG. 2.

The uterus was found to contain multiple fibroids—one large fibroid attached to the uterus extending into the left broad ligament, and many small ones distributed throughout the uterus; when the uterus was split after removal, about 200 c.c. of thick grayish, foul-smelling pus was found in the uterine cavity. In the lower portion of the corpus an ulcerated mass extended around the uterus just above the cervico-corporeal junction. Microscopic sections made from this ulcerated area verified the diagnosis of carcinoma of the corpus uteri (Fig. 2). The carcinoma had become infected and produced the condition of pyometra. The patient made an uneventful recovery, and to date, two years after the operation, is quite well.

CASE II.—Mrs. S. M., aged fifty-two. First seen May 21, 1918 Occupation, laundress. Patient was married 30 years ago, but lived with her husband only a short time. Never pregnant. Family history, negative. Past personal history: Always well, except for

menorrhagia and metrorrhagia during the past three years. Menstrual history: Always regular until three years ago. Since then she has bled from the uterus more or less excessively. During the past four months the flow of blood has been almost continuous.

Present Status.—Pain in sacral and lumbar regions extending down the posterior surface of her left leg; excessive uterine hemorrhages; extreme nervousness.

Examination reveals a large fibroid tumor of the uterus; cervix apparently normal. Patient is also the victim of a small cystic goiter, and a mitral regurgitant murmur. Everything else negative. Advised thyroidectomy first; after recovery from this operation, hysterectomy.

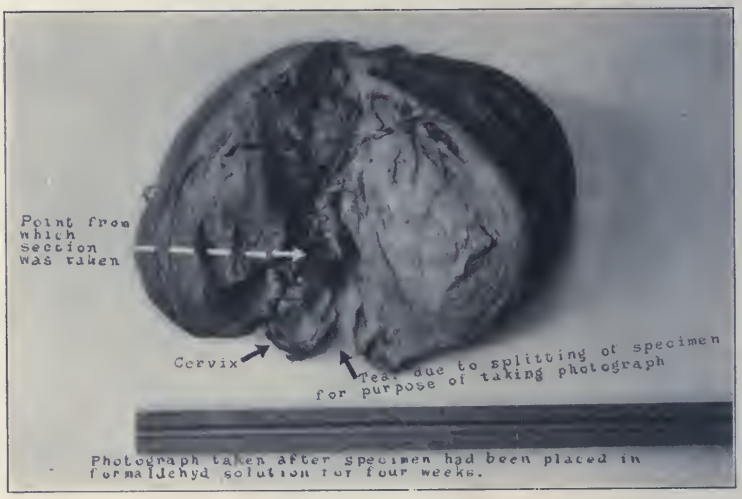

Point from which section was taken
Cervix
Tear due to splitting of specimen for purpose of taking photograph
Photograph taken after specimen had been placed in formaldehyd solution for four weeks.

FIG. 3.

Blood examination, made June 13, 1918, showed the following: hemoglobin, 59 per cent.; erythrocytes, 3,600,000; normal in size and shape. Coagulation time, 5 minutes. Urine, negative.

Operations.—Thyroidectomy, May 29, 1918, followed by an uneventful recovery. Abdominal panhysterectomy, June 17, 1918. The fibroid tumor (Fig. 3) was submucous in type, and as large as a fetal head. After the uterus was opened and careful examination of the endometrium was made, a small ulcerated area was discovered in the lower portion of the corpus (Fig. 3). From this, sections were made revealing adenocarcinoma (Fig. 4). Patient's recovery from this operation was prompt and satisfactory. She has been well ever since, and has gained twenty-five pounds in weight.

The writer hesitates to report so small a series of cases, but so little has appeared on this subject in the literature since Noble's (3) classic article, that he hopes his report will prove of interest and value. The author wishes to state further that not all of the speci-

mens were subjected to microscopic examination. Had this been done, a larger number of carcinomata might have been discovered.

The following plan for examination was adopted. All specimens were split open immediately after removal, and carefully examined macroscopically; if evidence of carcinoma was present, such specimens were then examined microscopically. In all cases where the history pointed to the possible existence of malignancy, the specimens were subjected to a microscopic investigation.

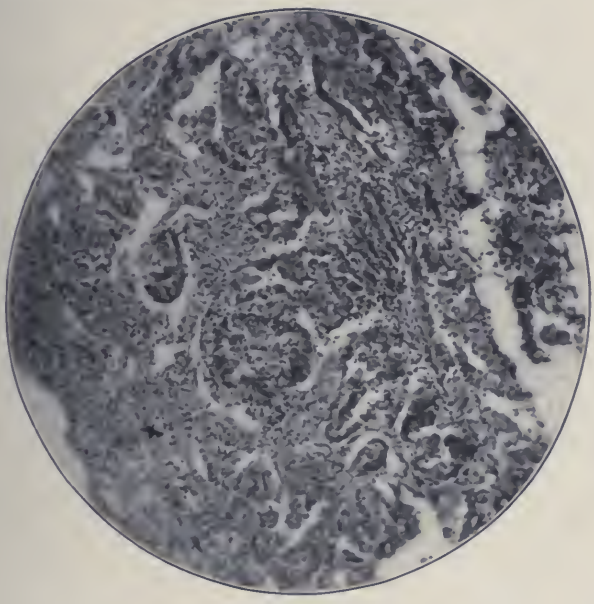


FIG. 4.

It is not difficult to make a diagnosis of myomata of the uterus; but it is frequently quite difficult to recognize the coexistence of carcinoma of the body of the uterus and fibroid tumors. It is well known that a large percentage of uterine fibroids do not atrophy during and after the menopause. It is also well known that women having myomatous tumors are apt to continue to menstruate well past the average duration of the climacteric period. It might not be far amiss to hazard the guess that women with fibroids, whose menopause has been postponed considerably, might have carcinoma or sarcoma associated with it.

The ultra conservative gynecologist of to-day advocates the removal only of myomata endangering life; the more rational men recommend that all myomata causing symptoms, or producing sterility, or interfering with labor, should be extirpated. There

exists, however, among the more progressive gynecologists a growing belief that the presence of myomata of the uterus constitutes always a potential if not an actual danger to the patient's life; and that, with few exceptions, all should be subject to surgical treatment.

From the statistics quoted we must realize that there is a certain and positive danger in leaving myomata alone. Noble estimated that 15 per cent. of the women whose fibroids are not treated will die of some complication of the tumor.

CONCLUSIONS.

From a review of the literature and statistics of various clinics, it would appear:

1. That the ratio of carcinoma of the corpus uteri to carcinoma of the cervix uteri where fibroids are present, is out of all proportion to a similar ratio where no fibroids are present.

2. That this observation would seem to point to the probability that the presence of fibromyomata within the uterus is a predisposing factor to the occurrence of carcinomata of the corpus uteri.

3. That it is difficult to state whether this is due to the irritation produced by the presence of fibroids in the uterine muscle, or to changes in the blood supply of the uterus, or to changes in the uterine mucous membrane from pressure.

4. That the statistics presented show a positive agreement, among the authors quoted, as to an unusual frequency of the association of corporeal carcinomata with myomata of the uterus.

BIBLIOGRAPHY.

1. Bland-Sutton. Tumors Innocent and Malignant. Funk and Wagnals, 1911.

2. Crossen. Diagnosis and Treatment of Diseases of Women. Mosby and Co., 1913.

3. Noble. Fibroid Tumors of the Uterus. *Jour. A. M. A.*, 1916, vol. xlvii, p. 1881–6.

4. Williams. Uterine Tumors, Their Pathology and Treatment. London, 1901, p. 196.

5. Cullen. Cancer of Uterus. Appleton and Co., 1900.

6. Winter. Die Malignen und Benignen Degeneration der Uterusmyome. *Zeitsch. f. Geburt. und Gynäk.*, 1906, vol. lvii, No. 1, p. 10.

7. Péquand. Fibromes et Cancer Utérius. Annals de Gynéc. et Obstet., July, August, September, 2nd series, 1905, vol. ii, pp. 393, 485, 583.

8. Klein. Blutuntersuchungen bei Unterleibsleiden der Frauen, besonders bei Unterusmyomen. *Centralb. f. Gynäk.*, 1905, No. 31, p. 969.

ECLAMPSIA: IS IT PREVENTABLE?

BY

JAMES KNIGHT QUIGLEY, M. D.,

Rochester, New York.

Efficiency is the word of the hour in industry to-day. If a product is not what it should be, the plant, the factory, or the men responsible for the lack of efficiency are improved, displaced, or abandoned. Efficiency methods should likewise be employed in the practice of medicine. If we are not using the knowledge of proved worth at our disposal, we are inefficient. The author makes no claim for originality in this brief paper; but he believes that by calling attention to a preventable disease of the most serious consequence, he will be of help to all the members of his profession.

That eclampsia is, usually, a preventable malady has, in my mind, become almost a conviction. That there are exceptions, however, I am willing to admit, especially when, in spite of painstaking care, convulsive seizures so quickly follow the earliest symptoms of toxemia as to render prophylactic treatment valueless. These cases are, I believe, quite rare. My conclusions are the result of observation for fifteen years of cases seen in private and hospital practice. At the outset I wish to be clearly understood. It is not my purpose to prove that toxemia of pregnancy, which occurs in about four per cent. of all cases, is preventable, but that its most serious manifestation, eclampsia, can usually be overcome.

To-day we look upon puerperal infection as, for the most part, preventable. The denial of this statement would lay us open to the criticism of clinging to antiquated ideas, and yet in the registration area of the United States in 1915 we had 4,314 deaths from sepsis! That this total is the possible minimum, no one believes; nor do I think that the proportion of cases developing toxemic convulsions is so small that it cannot be reduced. There were 2,673 deaths in the registration area in 1915 from convulsions or coma in pregnancy.

As long as the care of thousands of parturient women is annually intrusted to midwives, we shall continue to have sepsis and eclampsia. We should not, however, unthinkingly place all the responsibility for unsuccessful obstetrics upon the midwife, for just as poor results

are obtained by physicians themselves as a consequence, first, of insufficient instruction in obstetrics—a condition which is now, happily, changing—and a failure on the part of physicians to live up to their opportunities; and, secondly, of a failure of the patients to realize the importance of thorough, painstaking pre-natal care, and to co-operate in obtaining it.

We often think of eclampsia as a relatively rare condition. I have already said that toxemia of pregnancy has been estimated as occurring once in every twenty-five cases, though this, like the incidence of eclampsia in general, is difficult to prove. Estimates are, however, fairly in accord, and one to five hundred, or one-fifth of one per cent., is the average given by most authorities. The statistics of maternity hospitals which are clearing houses for abnormalities of all kinds are, of course, much higher, varying between .34 per cent. (Reinberg, Paris) and 2.68 per cent. (Lichtenstein, Leipzig). Edger, in 1200 cases, 800 of which were in an out-patient service, found one case in 171.

Of the etiology of eclampsia we know very little. Its treatment and prevention are, therefore, empirical, and it seems presumptious in this day of scientific exactness to outline the prophylaxis, although few conditions whose cause is so little understood respond so well to energetic treatment.

Since I have rather arbitrarily claimed that this dread disease is, in the main, preventable, it is now incumbent upon me to state how and in what manner it may be avoided. We have recently witnessed a great outburst of enthusiasm over pre-natal care, and may well ask whether or not it is justified, as time, energy, and money are being expended in this work in many cities. One of the chief purposes of such a clinic is to teach the hygiene of pregnancy so carefully as to prevent, if possible, the occurrence of toxemia; and if not possible, to detect its earliest manifestations and to prevent the appearance of more serious ones. If eclampsia can be avoided or the number of cases can be lessened, do the results of pre-natal care show it? "By your fruits are ye known."

In my attempt to prove, if possible, the efficiency of pre-natal care, I have collected statistics from lying-in institutions conducting pre-natal clinics, ignoring purposely the statistics of hospitals in computing the frequency of eclampsia, as these are not comparable to those which are the results of general practice.

Boston Lying-in, Out-patient Department.—Irving reports that in the period between February 28, 1912, and March 11, 1915, 4,472 women were confined. Of this number nine developed eclampsia,

or approximately 1 to 500, which is the average frequency of this condition. Of the nine, however, six did not report to the clinic for over one month previous to the onset of the seizure, and thus it is manifestly unfair to include these in the number of patients receiving attention. The other three faithfully carried out instructions, but in spite of their care developed convulsions. This result gives, then a frequency of 1 to 1500. There were 58 cases of toxemia, 29 of which cleared up after eliminative treatment and went on to a successful termination of their pregnancy.

The John E. Berwind Free Maternity Clinic, New York City: In the seven years from 1910 to 1916 inclusive, 8,925 cases were confined in the tenements by students and staff of the institution after pre-natal care in its clinic. There were in this number eleven cases of convulsions, or 1 to 811, this general average being much increased by the inexplicable occurrence of five cases in one year. If we glance over the report year by year, we find the following statistics:

1910, 999 cases confined; no case of eclampsia
1911, 1113 cases confined; 1 case of eclampsia
1912, 1215 cases confined; 1 case of eclampsia
1913, 1367 cases confined; 5 cases of eclampsia
1914, 1417 cases confined; 1 case of eclampsia
1915, 1497 cases confined; 2 cases of eclampsia
1916, 1257 cases confined; 1 case of eclampsia

As three of the total of eleven were emergency cases, having never been seen before the call for confinement, the proportion is then changed to 8 in 8,922, or 1 to 1115.

Lying-In Hospital of the City of New York.—The only statistics available at the present are those prior to 1909. From the appearance of the first records down to 1909, 46,252 cases had been confined in the Out-patient Department. Among these, 43 developed toxemic convulsions, or 1 to 1075 labors. Most of these cases had received some pre-natal attention, for they were examined at least once and had been given at least one urinalysis. This took place in what we then called the antepartum clinic, so that pre-natal care is not entirely new, but only intensified and rechristened.

PRE-NATAL CLINIC OF THE ROCHESTER GENERAL HOSPITAL.

This clinic has been in existence only three years and the total number of cases seen is not large. Since its inauguration 756 women have received pre-natal care, of these one developed a toxemia which culminated in one convulsive seizure, but recovered.

As a summary of the statistics of the four clinics whose reports are available we have the following:

New York Ly.-In	prior to 1909; 46,252 cases;	43 eclam.;	1 to 1,075.
Boston Ly.-In.	1912 to 1915; 4,472 cases;	3 eclam.;	1 to 1,500.
Berwind Clinic	1910 to 1916; 8,923 cases;	8 eclam.;	1 to 1,115.
Rochester Gen'l	1916 to 1919; 756 cases;	1 eclam.;	1 to 756.
	Total 60,402	55	1 to 1,098

That this proportion is so low is, I think, significant, though theoretically in general practice it should be lower, for the average time of the first visit to the pre-natal clinic in free institutions is about the seventh month; whereas it is the custom of private patients to report much earlier. In addition to the advantage of earlier observation, we find among private patients, because of their higher grade of intelligence and improved social conditions, the willingness and ability to carry out all directions for prophylactic treatment.

How is it possible to detect the first symptoms? The answer to this question resolves itself into two factors: first, alertness on the part of the physician; and secondly, the education of the patient and her co-operation. In the first place, during the first six months all cases should be urged to report at least once a month, and later at least fortnightly. Each patient should be impressed with the fact that it is to her interest, in fact, her safety to report regularly, and the physician should not find it necessary to remind her, by letter or by personal call, that she has been remiss. The instruction of a patient in personal care during pregnancy can be much facilitated by the use of a small printed card or folder, upon which should be grouped the directions relating to clothing, diet, exercise, constipation, and so forth. A list of symptoms which should be called to the attention of the physician may also be given, and should include danger signs in toxemia. The bood pressure should be taken and recorded at each visit, and the patient should be questioned briefly as to the occurrence of anything unusual in her condition.

Persistent headache is always a suspicious symptom during the last three months and should be considered indicative of toxemia until it is proved otherwise. I have recently seen two cases whose chief complaint was not headache, but a persistent and excruciating pain in the back of the neck.

Pruritus, if severe and persistent, I have become accustomed to look upon as an indication of toxemia.

Edema of the extremities is usually due to the pressure of the enlarging uterus, but it is not fair to our patients or to ourselves to

dismiss it from our minds until by the absence of other symptoms toxemia is eliminated. Vomiting occurring late in pregnancy after its cessation in the early months is more often indicative of an organism loaded with toxins than of a disordered stomach. Disturbances of vision, blurring, spots before the eyes, and flashes of light are to be noted. Epigastric pain, though not a common occurrence, is a very significant and usually an ominous symptom. I recently heard of a case in which epigastric pain was treated as indigestion for two days, after which convulsions supervened, terminating in death. In this instance the pain was the only symptom complained of by the patient prior to the seizure. Diminution in the amount of urine is, of course, one of the chief danger signals. Insomnia, extreme restlessness, or somnolence may call our attention to the patient's condition. Muscular twitchings or excessively severe cramps sometimes occur.

These, then, are the symptoms. What are the signs? First and foremost, an increased systolic blood pressure. The sphygmomanometer, in obstetrics, is as necessary as a stethoscope; in fact, if I were given the choice between the test tube and a blood-pressure instrument, I should choose the latter. I make this statement unreservedly, but I do not wish to be misunderstood. Urinalysis should not be ignored and entire dependence placed upon blood pressure, as I have seen done. In a condition fraught with such grave consequences as eclampsia, any and all means should be employed in discovering its earliest signs. For six or seven years I have taken blood pressure determinations as a routine each time the patient has been seen, and I know they have been of inestimable value. The following deductions are made as a result.

The normal blood pressure during pregnancy is lower than that of the non-pregnant, often 100 to 110 (systolic reading). In the non-pregnant it is higher as age advances. Any increase, therefore, is significant, for in toxemia this increase often precedes the development of albuminuria. An increasing blood pressure is more to be feared than a moderately high one which is stationary. Moderate elevation of blood pressure may occur without other signs of toxemia; but a reading of 150, which is not lowered by treatment, should be looked upon with apprehension. Albuminuria always accompanies increased blood pressure in severe toxemia, though it may not appear at an early stage.

Urinary signs: Albuminuria and a diminution of the total amount of urine for twenty-four hours, together with high blood pressure and headache, really constitute the four cardinal points in the diag-

nosis of pregnancy toxemia. Ten or more years ago we attached much significance to the urea output. This is of little value unless we know accurately the nitrogen intake. Later Ewing and Williams called attention to the value of nitrogen partition (total nitrogen, urea nitrogen, and ammonia nitrogen). This process requires the services of a competent chemist and is of more value in acute yellow atrophy and vomiting of pregnancy than in eclampsia. It has been demonstrated repeatedly that convulsions may occur in the presence of an ammonia urea ratio near normal; and conversely, a high ammonia coefficient may exist with no threatening signs.

While fulminating cases of eclampsia appear sometimes like a thief in the night, and while it is not unusual to hear that a patient was doing her housework in the morning and was dead at midnight, nevertheless close questioning would elicit in almost every instance the fact that all was not well with her, and that one or more of the above symptoms had been noticed perhaps days before her death, but had been disregarded. Had she been instructed to report such symptoms at once, and had the physical examination confirmed them, immediate energetic treatment might have either forestalled the occurrence of a seizure, or so modified the degree of intoxication that recovery might have been possible. I believe this because I have seen desperate cases with no preliminary treatment or prophylaxis saved by energetic efforts, to say nothing of the cases carefully carried through labor and the puerperium without an increase in the gravity of the situation. A discussion of the prophylaxis of eclampsia quite properly should include the treatment of threatening signs. This might be tritely epitomized in three words; namely, rest, elimination, and diet. Rest in mild cases may be relative only and not confining. Elimination means free purgation by magnesium sulphate and diaphoresis obtained by the daily hot bath. Diet should have for its basis milk with the addition of cereals and fruits and abstinence from salt.

These simple rules, if faithfully carried out, will in the average case guide the patient into comparative safety. Toxemia is a very treacherous condition however, and we should not relax our vigilance. If we find on daily examinations that the blood pressure rises, and that the total urinary output lessens with an increase in albuminuria, the patient must be put to bed and the diet limited to milk only. This treatment failing, induction of labor should be seriously considered.

As far as the use of vasodilators to lower blood pressure is concerned, I have never felt that the lowering of the blood pressure in

itself signified anything more than the treatment of a symptom. Would it not be as logical to give aspirin because the patient complained of headache? To be sure, convulsions rarely occur with a low systolic reading; but why should we not arrive at the same result by removing the cause through elimination?

SUMMARY.

1. Eclampsia is, in the large majority of cases, preventable. The statistics of pre-natal clinics prove this statement.

2. This means careful pre-natal care.

3. The most valuable single criterion of impending convulsions is a rising blood pressure.

4. In the presence of toxemia treatment must not be casual, but energetic.

5. Rest, elimination, and diet summarize the plan of treatment.

In conclusion, I wish to quote a portion of an editorial in the December, 1917, issue of the American Journal of Obstetrics: "The Mortality from Childbirth."

"Maternity and the proper recognition of the peculiar functions of women in this world must receive adequate acknowledgment and recognition before we can hope to reduce the element of danger which accompanies it. That we may ever eliminate entirely the factor of risk in childbirth is out of the question, for we have no direct control over many of the complications of pregnancy and labor, but a greater effort must be made to reduce the preventable complications and the mortality which attends them. A failure to do so can only reflect on a profession which has come to regard the prevention of disease as one of its leading and important functions."

CASE REPORTS.

Case I.—Previous eclampsia. Mrs. D. C. G. No. 325. In 1912 this patient was seen in consultation. She was a primipara of 35, at full term, in a semi-conscious condition with a systolic blood pressure of 200, vertex position, no engagement of the presenting part. Induction of labor with Vorhees bags and eliminative treatment was instituted. This resulted in the still-birth of a seven-pound baby. The mother had severe post-delivery shock which responded to energetic treatment, and she made a slow, but complete recovery. Four years later this patient was seen in the tenth week of her second pregnancy, with a blood pressure of $^{60}/_{174}$ and a trace of albumin in the urine. As she was very eager for a child and willing to assume the responsibility and to incur the hardship of a strict regimen, including a reduced diet and periods of rest in bed, I undertook the care of her case. Urinanalysis was done,

and the blood pressure taken every two weeks or oftener (later in pregnancy daily). With one or two exceptions the urine was never free from albumin, and the systolic blood pressure remained constantly above 170 mm. At about the seventh month, because of a rising arterial tension and an increase in the albuminuria, the patient was put to bed. Her diet consisted of one quart of milk and two slices of bread in 24 hours, and she received one-half ounce of magnesium sulphate daily. She remained in bed about a month and at eight and a half months went into labor, delivering herself of a small but strong baby. Three weeks post-partum the albumin had disappeared, and her blood pressure had fallen to 145. At present, sixteen months after delivery, the patient and her baby are quite well.

Case II.—Toxemia with rapid onset. Mrs. L. P. No. 207. The wife of a physician and also the daughter of a physician, presented a history of normal confinement eight years previous. All urinanalyses, and they were done fortnightly, had been normal up to the sixth month, and the systolic tension had never exceeded 125 mm. For two days (patient is now six and a half months pregnant) she had noticed edema of the ankles and to-day of the face. A severe occipital headache developed to-day, and she first noticed epigastric pain. For the past few days a generalized pruritus has caused her no little annoyance. She was sent to the hospital, put in bed, given high colonic irrigations of tap-water, and put in a hot pack. Magnesium sulphate was given in saturated solution every hour. In the afternoon her blood pressure had gone from the morning reading of 165 to 182, and no urine had been passed, at 8 p. m. The headache and epigastric pain were worse; the bowels were moving freely. At 11 p. m., after she had vomited a basinful of water, her head was relieved and she fell into a natural sleep. On the following morning the patient said she felt still better, though there had been no increase in the urinary output, a total of only four ounces in twenty-four hours. The husband and father were both extremely anxious that labor be induced, and after consultation this was agreed upon and accomplished by Vorhees bags. After a labor of fifteen hours she was delivered of a child weighing three pounds, which lived but a few hours. The symptoms and signs improved rather slowly after delivery. The total amount of urine for the first few days of her stay in the hospital was as follows: first twenty-four hours, three ounces; second, seven ounces; third, thirteen ounces (delivery occurred here); fourth, seventy-four ounces; fifth, ninety ounces; sixth, eighty-nine ounces. The amount of albumin decreased gradually, until at the end of three weeks only the faintest trace was present.

Comment on this Case.—The almost total suppression of urine was the determining factor which led to the decision to interfere. I do not think this case would have permitted of palliative treatment for a time sufficient to insure viability for the child.

Case III.—Toxemia of moderate severity which was manifested chiefly by objective signs, and which responded quickly to treatment.

Mrs. C. B., No. 408. The sister of a physician, a large robust woman of twenty-five, the picture of health, came to me in the fourth month of her first pregnancy. The urinanalyses up to the eighth month were normal, and the systolic blood pressure, while not high, was above normal, varying between 128 and 140. There has been no early nausea, vomiting, or constipation at the eight month, though the blood pressure arose to 148 and there was a trace of albumin. She then complained of a slight epigastric pain and much "heartburn," and reported a diminution in the twenty-four-hour amount of urine. She was accordingly put upon a reduced diet and her activity restricted somewhat. Ten days later her blood pressure had gradually reached 172, there was a slight disturbance in vision, and the albumin had increased considerably, but there was no headache at any time. As she lived on a farm seven miles from the city, it was deemed advisable for her to come to the hospital for closer observation and treatment. Although feeling quite well and looking extremely so, she acquiesed and was put to bed on an allowance of one and a half pints of milk for twenty-four hours and daily doses of magnesium sulphate and daily hot baths. Under this treatment her blood pressure fell to 142, and two days later she went into labor, two and a half weeks before term, and was delivered of a healthy baby.

Comment.—I report this as the type of case which, untreated, would probably have become extremely toxic and would have been called a fulminating case when it was nothing of the kind; for close observation of just two factors, her blood pressure and albuminuria, afforded ample time to avert serious consequences. Had we waited for more marked subjective symptoms, the case would, I am confident, have resulted disastrously.

Case IV.—Illustrating the fallacy of dependence upon symptoms alone and the necessity of routine pre-natal care. Mrs. J. G., aged 30, with a history of one previous pregnancy which was normal, as were here delivery and pueperium. I was called to see this woman, as her own obstetrician was out of town. She was complaining bitterly of a blinding headache with vertigo, and said she had passed only a small amount of urine in the last twelve hours. This condition dated from the previous evening only, for prior to that time and, in fact, during her entire pregnancy, she said she had been unusually well. For this reason she had not reported for examination or had had a urinanalysis for two and a half months, though urged by her physician to report regularly. (I learned later that the last examination had been normal). The patient said she was about eight months pregnant, though she seemed no more than seven. Her complexion was pasty, her eyelids were edematous, and she had a coated tongue. Heart examination showed an accentuated second aortic sound, pulse 56 systolic, B. P. 210 mm. She was loath to go to a hospital and was put to bed at home, with an allowance of one pint of milk in twenty-four hours, water in abundance, daily hot baths, and hourly doses of magnesium sulphate. In the evening (seven hours later) her B. P. had fallen to 186, and she

felt much better. The amount of albumin in an ordinary Esbach tube was over the highest graduation. For the next two days her symptoms improved, including an increasing amount of urine and slightly lessened percentage of albumin, but her blood pressure remained around 200 mm. On the third day she was very drowsy all day, and accordingly she was taken to the hospital, where more active efforts at elimination were instituted, including high colonic irrigations and dry packs. There efforts were rewarded with an amelioration in her threatened toxic state (B. P. reaching 135 systolic.) On the eleventh day after the onset of her headache she went into labor spontaneously and was delivered of a premature child weighing three and a half pounds, which nevertheless has continued to thrive and gain. As for the mother, the albumin and tube casts disappeared, and the arterial tension remained nearly normal. One interesting fact in connection with this case was that when the patient's condition was most critical, and convulsions were imminent. the urea-ammonia coefficient was 28.9. "A very safe figure." This quotation was appended to the laboratory report.

Case V.—Mrs. J. V., No. 508., aged 29, para, i. A rather large woman of sedentary habits given to over-eating. She reported on July 12, 1918, in the third month for her first antepartum visit. She had been married eight years and had never been pregnant. In 1916 she underwent an operation for sterility, and since has always been in good health. Except for slight nausea she says she feels well. The urine is nornal, her systolic blood-pressure is 152. Because of this she was cautioned as to her diet and elimination.

In August the blood pressure was 140. She carelessly omitted her September visit, and in October, when she reported again, there was a small amount of albumen in the urine and the blood-pressure, 162. She was told to take saline cathartic sufficient to insure at least three loose stools a day, and was put upon a reduced diet and hot baths daily. One week later (Oct. 9th) because of an increase in the albuminuria and the appearance of edema of the face and hands, she was put to bed and her diet reduced to crackers and milk.

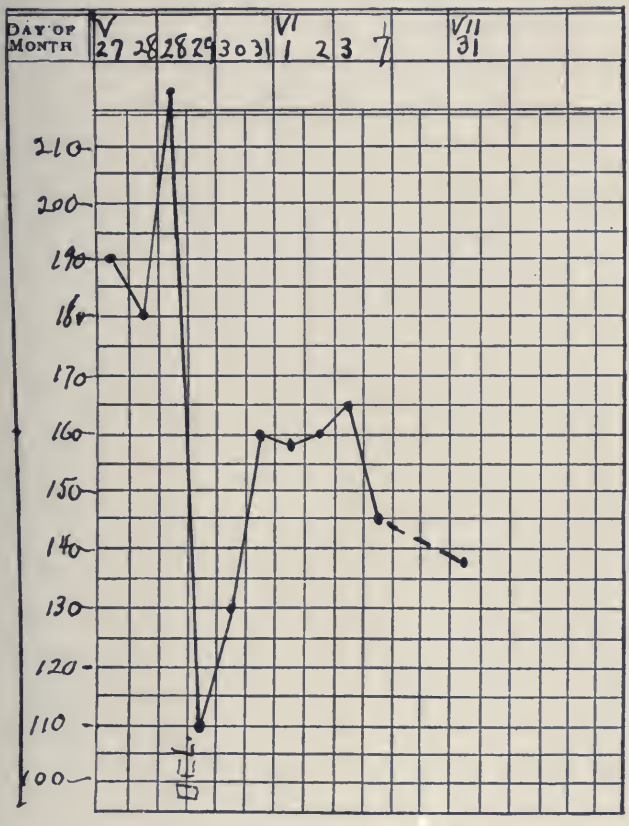
During the next twenty days the blood-pressure fluctuated between 152 and 190. The note of October 24th says "she has had epigastric pain for four days, but no headache, vertigo, or insomnia." There was about .3 per cent. albumin at this time. She was sent to the hospital and the eliminative treatment intensified by the use of sulphate in generous doses. The epigastric pain cleared up, and except for the hardship of a diet reduced to a minimum and an enforced rest in bed, she was quite comfortable and free from symptoms. Although the blood pressure reached a somewhat lower level and the albumin was much reduced, neither ever reached normal.

On November 11th she went into spontaneous labor and delivered herself of a fetus weighing two and one-half pounds. As the entire ovum was passed in one piece, the baby did not, of course, survive; but the patient made a satisfactory recovery.

Case VI.—As an example of prophylaxis of eclampsia which really resolved itself into the treatment of pre-eclampsia, I quote the following case.

Mrs. E. Mc. Rochester General Hospital No. 69720. Aged 28 years. I para. Father died at sixty of cerebral hemorrhage; mother living and well; two brothers and one sister alive and well. Past history: Measles and mumps in childhood. Present history: Last menstruation, October 13, 1918; expected date of confinement July 20, 1919.

This patient reported first to her physician in January. She visited him again, once in March, and once in April. She brought



BLOOD-PRESSURE CHART OF CASE VI.

a specimen of urine at each visit, but no examination was made other than the urinanalysis, which she was told was normal. In the early months there had been nausea or vomiting, but she was constipated. She felt perfectly well up to May seventh, when she noticed puffiness of the face and some headache. She slept little, walking the floor night after night because of the insomnia. These symptoms did not excite her alarm; in fact, she thought them natural to her pregnancy. There was no epigastric pain or disturbance of vision.

Nineteen days after the first appearance of symptoms, May twenty-sixth, she called her doctor at night, having become alarmed at the edema of the legs. He took a sample of urine and, finding albumin in it, sent her to the hospital the next day.

Condition on admission May twenty-seventh. Patient is a tall, thin blonde showing some anemia, and edema of the face and extremities. She is extremely neurotic, hyperexcitable, and complains of severe pain in the back of the neck. Urinanalysis: Urine is cloudy; reaction, acid; specific gravity, 1010; and contains albumin, 7 per cent. Occasionally hyaline and a few granular casts are found. Blood-pressure, 190/90.

Treatment.—Magnesium sulphate one-half ounce hourly (three doses) and dry pack. The patient was allowed one pint of milk, and water was forced. She perspired freely, had frequent loose stools, and the next morning seemed a trifle better; her blood pressure had fallen slightly (180). This plan of eliminative treatment was continued during the day, but by evening she was decidedly worse. The change in her appearance was marked, the edema had increased, she was extremely restless, and complained of spots before the eyes. The systolic blood pressure had gone to 222. I became convinced that immediate delivery was imperative and, having obtained, after some delay, permission to operate, performed a vaginal section at 8 P.M. The baby, quite small and premature in appearance, was resuscitated, but lived only a few hours. The mother's toxic state improved slowly but steadily, her convalescence being prolonged by the neurotic condition.

In my comparison of this case with the four succeeding cases the question arises, would there have been a greater probability of a living child, and would the mother have made a more rapid recovery, had intensive prophylaxis been instituted earlier?

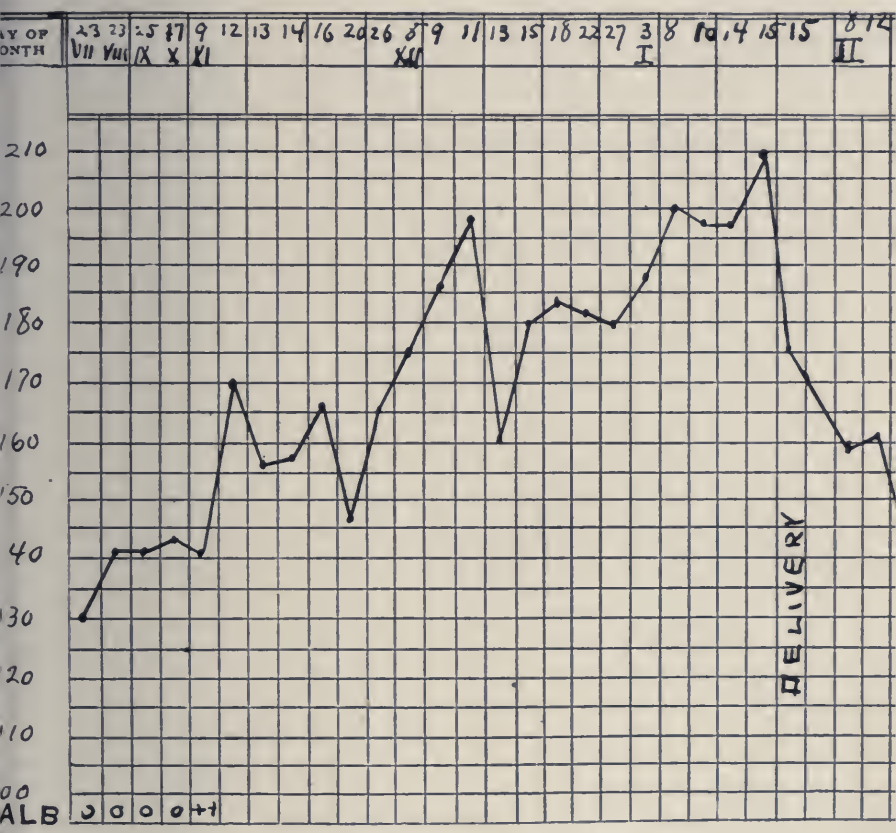
CASE VII.—Mrs. S. H.; No. 541; aged twenty-seven years; 1 para. Reported in the third month of gestation, July 23, 1918. She was quite a robust woman, and had had measles and malaria in childhood; "gravel" six and again four years ago. She also gave a history of tapeworm. She has slight nausea, and is quite constipated. Systolic blood-presssure, 130. No albumin in the urine.

At the next visit the blood-pressure had risen to 142. Meat was then excluded from her diet and the catharsis increased. For two months she did well. On November eleventh she had severe pain in the right renal region, requiring morphia for relief. There was a small amount of albumin in the urine, but no red blood cells. The blood-pressure had gone to 170. She was put to bed, and placed on a milk diet with some carbohydrates. As a result, her pressure dropped, and the albumin lessened with a corresponding increase in the daily amount of urine.

For the next two months this patient was kept under very close supervision. Her condition fluctuated considerably during the latter half of this period, when she was permitted to be up and about her room. Granular casts made their appearance in a specimen of urine containing two and one-half per cent. of albumin. She was

again put to bed, and her diet restricted. She perspired freely, and voided a fair amount of urine in the next twenty-four hours.

On January 15, 1919, about two weeks before the expected date of confinement, she went into labor spontaneously and delivered herself of a four and one-half pound girl baby, who did very well, because of the fact that she was breast-fed. The mother made a protracted, but complete recovery. The highest systolic blood-

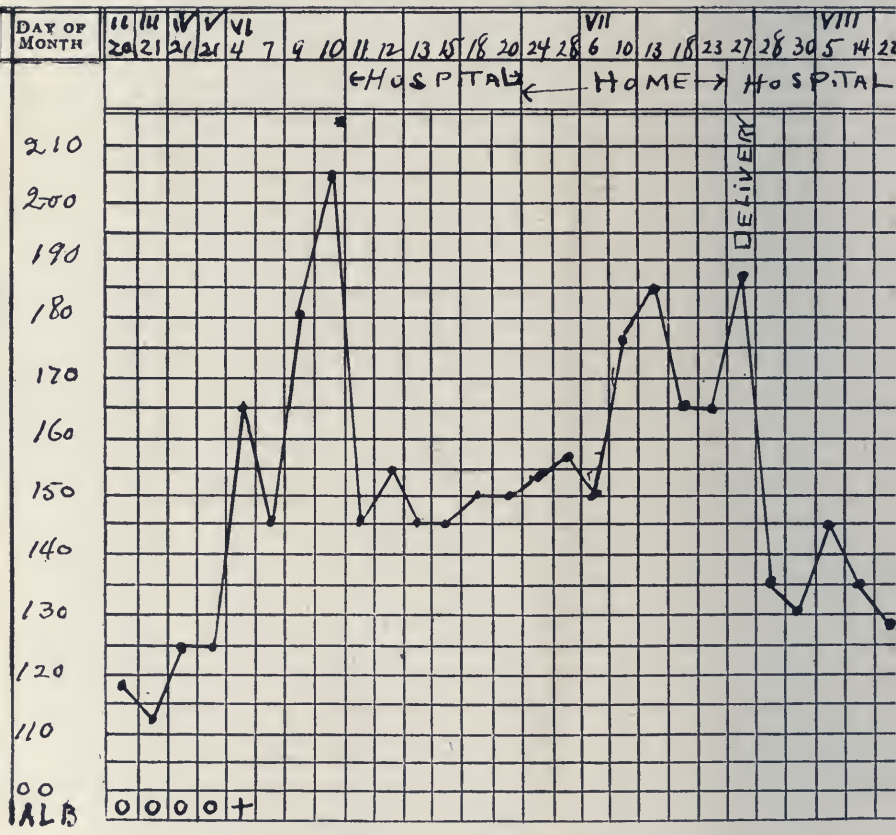


BLOOD-PRESSURE CHART OF CASE VII.

pressure before labor was 200, coincident with two and one-half per cent. albumen. During labor the blood-pressure reached 210, but immediately after labor it fell to 176. One month later it was 146.

CASE VIII.—Mrs. K. K.; No. 347; aged twenty-two years; I para. Past history without interest, except that she has always been quite well. First seen February 20, 1917, when pregnant four months. Expected date of labor, August 9, 1917. Present history: No nausea, vomiting, constipation, or edema. Physical Examination: Patient is five feet and three inches in height; weight, 105

pounds. Obstetrical and general examination reveals normal condition. Blood-pressure, 118. Urine normal. The visits of the following three months showed the patient still normal. On the next visit, June fourth, there was a small amount of albumin in the urine. Blood-pressure, 160. She complained of spots before the eyes, and had noticed a diminution in the daily amount of urine. She was ordered to bed, placed upon a strict milk diet, and free doses of magnesium sulphate. This treatment was rewarded by a tem-



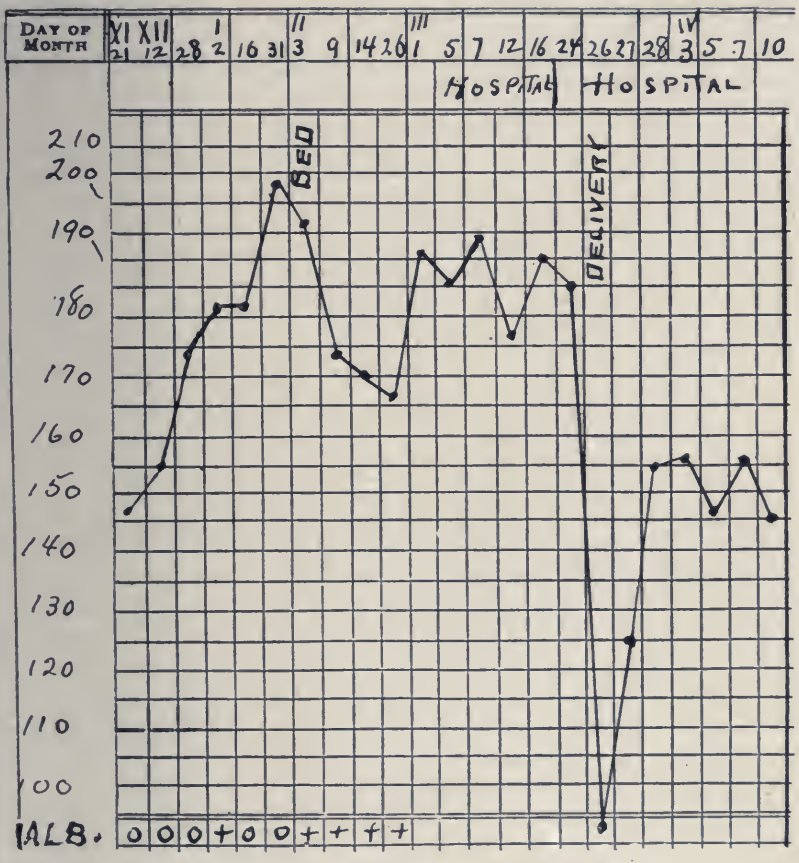
BLOOD-PRESSURE CHART OF CASE VIII.

porary improvement in all of the symptoms. Six days later the blood-pressure went up to 200, and the patient complained of severe headache.

She was now transferred to the hospital, where she was given hot packs, hot colon irrigations, and morphine for headache and restlessness. Marked improvement resulted. Three weeks later she was permitted to go home, but was kept on a fairly strict regimen for almost four weeks. On July twenty-seventh, within two weeks of full term, she was seized with epigastric pain, return of albumin

in the urine, and a rising blood-pressure. This condition led me to induce labor on the following day at the hospital. A No. 3 Vorhees bag was employed. Labor set in promptly, and a boy, weighing four pounds and fourteen ounces, was born eight hours later. Both mother and child did well.

CASE IX.—Mrs. F. K.; No. 565; aged twenty-nine years; para I. Past history: Began to menstruate at fifteen. Very irregular, intervals varying from one to twelve months, hence it is



BLOOD-PRESSURE CHART OF CASE IX.

difficult to estimate the present duration of pregnancy. Married nine years. Never pregnant. Skin is very dry, resembling icthyosis, for which she is receiving treatment from a dermatologist. This condition became later exaggerated by hot baths, and its presence upon the breasts and nipples interferred with lactation. Physical Examination: Height, five feet and four inches; weight, 201 pounds. She leads a sedentary life and indulges in an abundance of good

food. Vaginal examination at first visit, November twenty-first, discloses a uterus of about a four months' pregnancy. Pelvic measurements ample. Urinanalysis, negative. Blood-pressure, first visit, 142; on the two subsequent visits, 168. Six weeks later, on January 3, 1919, a small amount of albumin was detected in the urine, and the sphygmomanometer registered 176. Her diet was restricted as to proteids, and hot baths and free catharsis were administered, though she was not kept in bed continuously. Under this treatment she was soon free from symptoms, and remained quite comfortable for four weeks later. On January twenty-fourth, she began to have headache and epigastric pain. Blood pressure, 198. At the time that her blood-pressure was highest and symptoms most threatening, there was no albumin in the urine. She was now kept in bed, and her diet limited to bread and milk. During February she improved in every respect. In March, in spite of energetic efforts at elimination, headaches grew worse and more constant. Blood-pressure again went up. She was sent to the hospital, where hot colon irrigations were added to the treatment.

Patient improved considerably; and after remaining two and one-half weeks in the hospital she went home against my advice. Four days later, March twenty-fifth, she went into labor marked by inertia for which the Vorhees bags, and eventually the forceps, were employed. She was delivered of a boy weighing four pounds and fourteen ounces.

The urinary output in this case for the first three days post partum was 31, 65, and 89 ounces respectively. On March twenty-first, the ammonia-urea coefficient was 30:1.

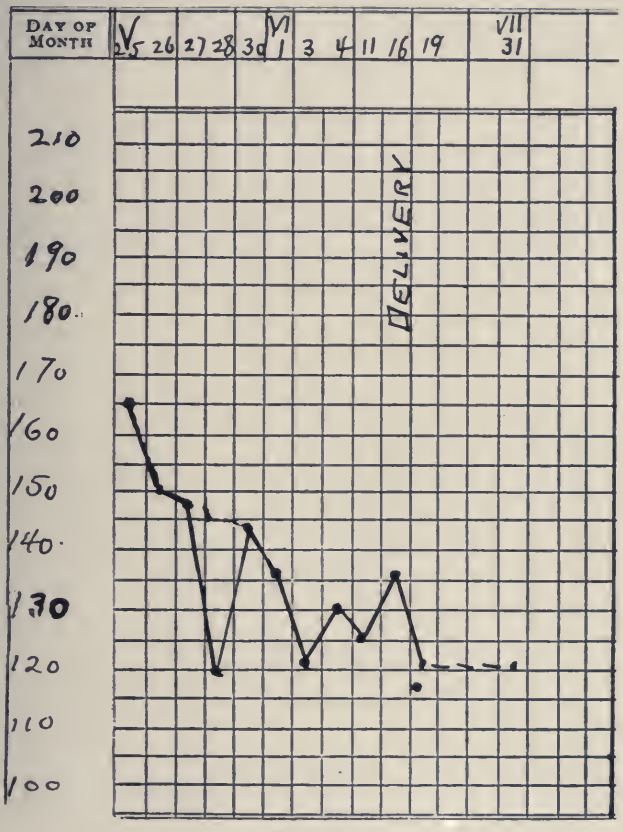
Only by intensive prophylactic care were Cases I, VII, VIII, and IX carried to the period of viability and the birth of living children made possible. That the course pursued was justified is proved by the fact that all mothers recovered, and all children lived.

Case X.—Mrs. H. S.; No. 640; aged twenty-four years; para II Past history: Had all the diseases of childhood except scarlet fever and diphtheria. In 1915, she had one ovary removed. In 1918, another laparotomy was performed for supposed tubal pregnancy, but proved to be appendicitis complicated by a normal pregnancy. She aborted a short time after the appendectomy. Menstruation began at her fourteenth year, recurring every twenty-eight days four consecutive times; since then she menstruated at intervals of one year. Last menstruation occurred during the last week of September, 1918. No nausea, vomiting, or constipation. Has enjoyed good health during the entire pregnancy. Within the past week her physician discovered a moderate amount of albumin in the urine, and a gradually rising blood-pressure. Patient resides in a neighboring village where there is no hospital, and for this reason she was referred to the writer, on May twenty-fifth, at the beginning of the ninth month of gestation. Physical Examination: Patient is a brunette of moderate weight, height, good color, and well nourished. Heart and lungs normal. Blood-pressure 164/104. She has a moderate sized goiter. Presentation vertex; position, right occip-

itoposterior. Urinanalysis: Color, dark amber, clear; specific gravity, 1028; urea, 10.7 gm.; total solids 46.8 gm.; NH_3 22; albumin .3 per cent.; urea, 1. Microscopical examination shows occasional hyaline casts, few epithelial cells, chiefly squamous.

Treatment.—Rest in bed, daily hot bath, magnesium sulphate, one ounce daily. Diet: milk, cereals, toast, fruits.

Patient responded rapidly to this treatment, and after about a fortnight was out of bed most of the day. As she felt quite well,



BLOOD-PRESSURE CHART OF CASE X.

her stay in the hospital became rather irksome. Her physician advised her against going home, fearing a recurrence of the toxic condition. As she was within one week of her estimated date of confinement, induction of labor was determined upon. A No. 2 Vorhees bag was introduced. Later a No. 3 was substituted. The patient was finally delivered by forceps. The mother and child, a boy of six and one-half pounds, left the hospital three weeks later in good condition.

CONCLUSIONS.

1. A good hospital is THE place for the treatment of toxemia of pregnancy of more than ordinary severity.

2. Cases that improve in a hospital had better remain there, if possible, because they never do as well at home.

3. Few cases clear up entirely before delivery, and eternal vigilance is necessary to success in the treatment of this condition.

4. By careful prophylaxis many cases of toxemia may be carried to the period of viability. Some cases are recognized so late that they terminate in eclampsia, for which some form of immediate delivery is imperative.

SYPHILOMA VULVÆ.

BY

ARTHUR STEIN, M. D.

Associate Gynecologist, Harlem and Lenox Hill Hospitals,

New York City.

(With two colored plates and eight photographs.)

THE reason why the descriptive term "Syphiloma Vulvæ" is applied to the disease under consideration rests on both histological and clinical grounds. Histologically, the hypertrophied masses of the diseased area are gummatous and subject to the familiar necrotic changes and cicatricial contractions seen in gummata. Clinically, the vulvar changes manifest themselves at the end of a long period, sometimes many years, after the primary infection. Moreover, luetic induration of the vulva is apt to supervene in the absence of all other specific changes after a long interval of apparent health, thus accounting in part for the many mistakes in diagnosis which have been committed.

As the old term "esthiomene" (from the Greek word, meaning "to erode"), first applied to the disease by Huguier in 1849, is purely descriptive and, therefore, too general, it is advantageously replaced by a name distinctly indicative of the syphilitic origin of this condition as shown in the title. The cutomary misleading nomenclature such as esthiomene, lupus vulvæ, etc., still found in the literature, should be abandoned and replaced by the characteristic "syphiloma vulvæ."

Although in a previous contribution on this subject the writer, with his collaborator(18), took the stand that the disease was the expression of a process set afoot by no known specific agent as a direct exciting cause, continued investigations in this field incline him more strongly to the opinion that these changes are always ultimately referable to a specific; *i. e.*, luetic infection. This view is gradually gaining ground in the literature, although some writers still interpret the affection as a primary id opathic disease; others, more numerous, as a manifestation of tuberculosis and sometimes carcinoma; a few are inclined to attribute it to lymphatic obstruction resulting in a form of pseudo-elephantiasis; and finally it has

been explained as a filth disease, beginning as a purely inflammatory change due to local traumatism or irritation, and maintained by neglect and lack of cleanliness. However, incontrovertible testimony is constantly accumulating to the effect that this peculiar and long unrecognized condition represents a tertiary syphiloma of the vulvæ.

It is noteworthy in this connection that in the Index Catalogue of the Surgeon General's Office, U. S. Army, 1915, Vol. XX, Second Series, under the heading of "Esthiomene" the reader is still referred to "Lupus" and "Tuberculosis" of the vulva, an entirely incorrect inference. Still more recently, in the second edition of Graves' Gynecology, 1918, page 229, it is stated that the disease is of obscure origin and does not yield at all to antisyphilitic treatment, although it is thought to have some possible relationship to syphilis. The writer challenges this statement on the ground that syphilis is always responsible for the disease and that specific treatment in combination with operative removal of the hypertrophied tissue is followed by decidedly favorable results, even in those cases where the syphilitic character of the lesion is not demonstrable by the customary tests. Unquestionably an etiological part is occasionally played by malignant disease and by tuberculosis in the production of *similar* vulvar changes, as in a case observed by Sir Malcolm Morris concerning a woman past middle age who, after having been for years subject to lupus of the face and other parts of the skin, developed the disease in the vulva.

If, on bacteriological examination of specimens, the tubercle bacillus is found, the case is one of lupus pure and simple, and is not related in any way to the disease under consideration. Primary malignant disease of the vulva in the form of epithelioma is of very rare occurrence and of comparatively more rapid growth than syphiloma, as I have shown in a previous paper. (Stein, A.—"Primary Carcinoma of the Vulva," *American Journal of Obstetrics*, 1916 Vol. LXXIV.) Its manifestations are not likely to be confused with the deep-seated subcutaneous nodules of a syphiloma situated between or upon the labia. The diagnosis is assisted by the patient's age and the point of origin of the changes. As was recently pointed out by Thorn(21), syphilis may exactly simulate cancer in any location, either of the viscera or on the surface of the body. The microscopical findings, however, will definitely establish the existence of malignant disease.

The great majority of vulvar indurations, including those in which no tubercular or malignant origin is demonstrable, should, in the

future, be charged to syphilis, and a suitable descriptive terminology ought to be adopted. The names of tertiary vulvar syphilide, syphilitic ulcerative induration of the vulva, or syphiloma vulvæ are in conformity with recent additions to our knowledge of this disease, which has puzzled several generations of investigators, although it was long ago recognized and described by Fournier(6) as well as by a number of German writers, and by J. N. Hyde(12) and R. W. Taylor(20) in this country.

Prior to the publication of Huguier(10 and 11) in 1849, who pronounced the disease to be a form of tuberculosis, emphasizing the similarity of diseases of the vulvo-anal region with those of the face—a view which has ever since persisted and recurred in the literature—certain cases of vulvar "esthiomene" had been correctly referred to syphilis, although cancer and elephantiasis were also regarded as responsible for the proliferation by the old writers. (The term "Elephantiasis Vulvæ" as applied to these cases is wrong. It should have been named "Pseudo-elephantiasis," a condition which *simulates* true elephantiasis, a disease of an altogether different etiology.)

The great French syphiligrapher, A. Fournier, whose clinical knowledge of syphilis far surpassed not only that of his contemporaries, but also that of writers of a much later date, gave an excellent description (1873) of this vulvar syphiloma, which he depicted as "composed of uniform, smooth, slightly protuberant, surface lesions, pinkish or reddish in color, dry and covered with a slight desquamation." He emphasized that these "surface lesions are not the result of fusion of several neighboring papules, but are originally formed by a papular neoplasm spreading over a large surface. The changes are of variable extent, sometimes occupying only one of the labia majora entirely or in part, or both labia may be involved together. Frequently the lesions encroach on the neighboring regions, on the genito-ural folds, the perineum, the thighs, and the mons veneris." It is noteworthy, he said, that they determine not only a considerable swelling of the affected parts, but also invest these parts with a very peculiar resistance and elasticity. A diseased labium majus, for example, is not only increased in size, but also both hypertrophied and indurated. Digital examination reveals a specific dry hardness without edema, which does not yield to pressure, but is resistant like sclerema.

In Fournier's graphic account the affected labium is described as "apparently lined with parchment" and the sensation experienced on touch is altogether unique.

(The above translations carefully follow the original ones and are given here because these lines, although written nearly fifty years ago, perfectly describe the disease loosely designated as vulvar esthiomene and still ascribed to a variety of other causes.)

Fournier's diffuse hypertrophic syphiloma of the vulva is commented upon as follows by Abraham(1) in "A System of Syphilis" published in 1914: "This consists in a massive infiltration of one or more parts of the vulva, which may become generalized over the whole of its extent. This infiltraton is of a stony hardness and may alter entirely the conformation of the parts so as to make the original structure absolutely unrecognizable." The enormous tissue destruction which is a pathognomonic feature of lues is the result of preponderance of the necrotic process over the tendency of fibrosis and contraction of scar tissue. Moreover, the peculiar combination of hypertrophy and ulceration is plainly indicative of lues.

Syphilis was recognized as the most probable causative factor by Grace Peckham(16) who, 1887, published a tabulated analysis of thirty-three cases, seven of which had a definite history and nineteen a probable history of syphilis. This high percentage would, undoubtedly, have been still further augmented by modern diagnostic methods for the recognition of lues.

James Nevins Hyde(12), 1889, is, like Fournier, a p oneer whose insight into the causes underlying this disease was too far ahead of the standard of his contemporaries to find ready acceptance. At that time he called attention to the clinical fact that a woman with a gummatous lesion of the vulva may not only betray no other symptoms of syphilis, but may exhibit all the other evidences of sound health. In his experience women were, far more frequently than men, the bearers of isolated syphilitic lesions.

It may be noted here that it requires special training to recognize syphilis in a single symptom. Furthermore, this lesion does not conform to the common preconceptions relative to other genital manifestations of syphilis. Not only is the syphiloma of far rarer occurrence, but it also does not in external features and career resemble chancres and so-called secondary lesions of syphilis having a vulvar site.

In 1890, R. W. Taylor(20) in a very complete and elaborately illustrated contribution to the subject described some illustrative examples of luetic deformities of these parts; namely, the various forms of hypertrophy induced by the indurating edema of syphilis; hyperplasia resulting from chronic ulcers, the so-called "chancroids" in intermediary and old syphilis; hyperplasia in old syphi-

litics presenting no specific character and occurring soon or long after the period of gummatous infiltration, in some cases being co-existent with specific lesions elsewhere.

Scattered through the older literature illustrative cases may be found showing an endeavor to incriminate syphilis as the responsible factor in these cases. For example, Boulton(2), 1883, operated upon a case reported by him as one of extensive syphilitic disease of the vulva with gummatous hyperplasia of the clitoris. He removed the hypertrophic clitoris with the cautery, and administered potassium iodide internally with very favorable results. The findings on examination are graphically described as a bifurcated mass, the size of a double fist, of hypertrophic clitoris and nymphæ hanging down in front. Goucher and Nathan(8), 1908, reported a case of chancriform syphilide of the vulva in a woman of forty-five years, whose left labium majus was enormously enlarged and covered with papular syphilides. The swelling subsided as a result of iodide injecti ns. Six illustrative observations on patients between twenty-two and fifty-eight years of age, suffering from tertiary syphilis of the vulva, were reported by Lena Kurz(13), 1913, who correctly designates the disease as a tertiary manifestation of syphilis but, unfortunately, still clings to the objectionable term of "esthiomene" or "lupus vulvæ."

R. Vignolo-Lutati(23), 1914, reported a case of tertiary, ano-rectal and vulvar syphiloma in a patient of thirty years who, before coming under his observation, had been treated elsewhere for some time for a vaginal affection which was diagnosticated as "esthiomene," and treated with repeated cauterizations. Her general condition became steadily worse, and she was finally admitted to a surgical clinic where the diagnosis of carcinoma of the rectum was made and an operation was recommended. When she was seen by Vignolo-Lutati in the Turin clinic, he made the diagnosis of syphilis, although the Wassermann test was negative, and specific treatment was instituted in the form of one to two weekly injections of calomel—gr. 5. Within two months remarkable improvement was obtained, both as regards the general condition and the local findings. The therapeutic effect thus confirmed the assumption of a tertiary recto-ano-vulvar syphiloma in this highly instructive case. The observer pointed out that the etiological diagnosis, confirmed by the treatment, was especially important on account of the coincidence of tertiary ano-rectal and vulvar lesions.

Four cases of syphilitic induration of the vulva in young colored women were very recently reported by Gallagher(17) who, on the

basis of his observations, concludes that a radical removal of the growth with complete and thorough cauterization of the ulcerated areas and intensive anti-syphilitic medication, will effect a cure in these cases. My own experience has led me to the same conclusion.

Etiology.—This disease is always due to syphilis, even in those rare cases in which the relationship cannot be established positively. Histological data, in the majority of the cases, afford conclusive evidence as to the specific character of the changes. When syphilis is not demonstrable, the disease must be considered as indirectly due to syphilis, having developed in an infected individual on a soil prepared and altered by syphilis. As modern methods of investigation improve, the number of cases in which positive signs of luetic infection will be found will continually increase.

Definition of Lesions.—Slowly progressive indurated tumors, causing no pain, and giving rise to inconvenience only through their cumbersome size. The swollen and indurated vulvar regions usually are the site of deep-seated ulcers which show no predilection for any particular part. This tertiary manifestation of syphilis lends itself in no way to confusion with the primary lesion on the genitals, but constitutes a well defined pathological picture confirmed by the microscopical findings which plainly reveal the familiar features of gummas (syphilomas).

The point of origin of vulvar syphiloma varies greatly, although three regions are especially susceptible; the order of frequency being the fourchette, the urethra, and the rectum. In certain rare cases the genital zone is at first free from all changes, the sclerematous lesions beginning with a low rectal or anal stricture and spreading to the genital organs through the recto-vaginal wall. As a rule the labia minora and the clitoris are involved in the ulcerative and hypertrophic process, and sometimes the entire vulva is deformed and altered in outline. This constant combination of hypertrophy and ulceration is characteristic of syphilis.

In order to present the subject matter as clearly and concisely as possible, I have arranged the description of the changes noted in syphiloma vulvæ under the separate headings of microscopical, gross, and clinical pathology, as follows:

Microscopical Characteristics of Syphiloma.—Histologically a syphiloma consists of a collection of round cells, closely resembling the cells derived from inflammatory neoplasms, with scanty blood vessels. The affected tissues, like all gummata, undergo processes of necrosis and cicatrization with contraction of scar tissue. Ac-

cording to Lubarsch(14), gummatous nodules are microscopically interpreted as granulating inflammatory products, which are especially rich in lymphocytes and frequently show fibroblasts and fibrillary tissue. The products pass either into solid connective tissue or undergo necrosis in the area of the cellular as well as fibrous portions, the original general tissue structure often remaining recognizable in the form of fibrous strands, traces of blood vessels, and cells without nuclei. Whereas small syphilomas, in their earliest stages, resemble condylomas and contain chiefly small inflammatory cells as well as plasma cells, those which have attained a large size possess a more variegated structure, containing plasma cells and epithelioid cells besides small round cells of lymphocyte type, and presenting diffuse extensive cascations, often surrounded by small nodules containing epitheloid and giant cells. These structures are liable to confusion with those of tuberculosis. The following features are of value for the differential diagnosis. In syphiloma the epithelioid cells are usually less numerous than the small granulation cells and plasma cells. Fibroblasts and fibrillar connective tissue are apt to be conspicuously represented in syphiloma, but are only exceptionally demonstrable in tubercles. Cascation is more extensive, as a rule, in syphilomas than in tubercles, and in the former it occurs in the stage of connective tissue transformation; whereas in tubercles cascation, invariably, precedes this change. As a result, a cascated syphilitic focus usually still contains demonstrable tissue elements, whereas a cascated tubercle forms an amorphous mass. In a general way, the diseased tissue presents hypertrophic and inflammatory changes. The microscope shows an accumulation of embryonic cells in the middle layer of the dermis arranged around the blood vessels and progressively diminishing in frequency at a distance from the vessel. The lymphatics are dilated and packed with endothelial cells. The subdermic tissue likewise contains a large quantity of dilated vessels. These lesions ultimately terminate in the formation of scar tissue and sclerosis.

Gross and Clinical Pathology.—It is a noteworthy fact that the affected parts present an entirely different aspect in the living and in the dead subject. After death the vulvar protuberances lose their turgescence, the perineal elevations and projections become flattened and lose their semi-erectile character. The induration and hypertrophy of the vulvar and peri-vulvar tissue disappear almost entirely. The protuberances become softened, flabby, and wrinkled. In the living subject the color of the affected region is apt to be reddish or purplish in youthful subjects, and dull gray or livid in older

women. The tegumentary covering of an infected labium majus usually presents a purplish color, the mucous membrane is often dusky red, and the abnormal coloration frequently extends to the adjacent labium minus.

A fully developed syphiloma of the vulva appears as a more or less symmetrical enlargement of the labia majora on both sides, so that the shape of the tumor thus formed was compared by Hyde to that of a horse collar. The clitoris above is enlarged and sometimes represented by one or more soft or solid projections. The labia majora are much enlarged, fibrous and thickened, furrowed, ridged, or become the seat of fungosities. In some cases they have been found to contain very hard tumors the size of a marble. The labia minora are changed and deformed, and, not infrequently, the seat of ulceration is at their internal aspect and free borders. The vestibular region is greatly thickened, superficially or deeply ulcerated, either diffusely infiltrated or interspersed with circumscribed nodules. These vulvar ulcers have very irregular edges and discharge a scanty, at times purulent secretion.

The luetic process may extend to the perineum and anus, manifesting itself in the form of large or small fleshy masses and excrescences. In a case under my own observation (II) the labial ulceration encircled the introitus vaginæ and extended for some distance into the vagina. Hyde refers to a case in which the vagina and rectum were converted into a wide chasm bridged by a few persistent strands of vulvar or vaginal connective tissue.

Syphilomas, here as elsewhere in the body, may heal, leaving deep radiating and adherent cicatrices; but they are more apt to give rise to destructive ulceration, especially in the vulvo-vagino-anal region. This behavior can be explained by the existing circulatory disturbances due to a primary change of the efferent lymphatics and regional blood vessels through the syphilitic infection.

Clinically the disease is essentially characterized by its painlessness, non-interference with the patient's general health, and disproportion between the local changes and the resulting disturbances. The affected parts are not abnormally hot. There is no itching, as a rule no tenderness on pressure, and no evidence of acute congestion. Until the condition has become complicated by ulceration of the vestibule, with more or less invasion of the urethral orifice and canal causing painful micturition, or by perineal infiltration with anorectal involvement, resulting in painful, sometimes bloody, stools, the patients, as shown by my personal observations, the cases recently reported by Gallagher, and numerous others, scattered

through the literature, are remarkably free from pain or other subjective symptoms.

Treatment.—As shown by my personal findings and the above-quoted observations of other writers, the treatment of syphiloma vulvæ is both surgical and medical. Operative interference consists of excision and destructive cauterization of all tumors and excrescences. This radical procedure is usually effective and not followed by a recurrence of the condition. Intravenous injections of salvarsan are an essential supplement of the surgical treatment. The prognosis is very favorable, as is to be expected in properly treated gummatous changes of tertiary syphilis.

The following two cases came under my observation at Harlem Hospital, New York City, (Service of Dr. G. Haynes) where they were treated simultaneously:

Case I.—L. V. Single. Colored. Aged 20. Admitted to the Hospital May 5, 1919. Family history, as well as previous personal history negative. Menstrual periods began at 13, occur regularly every four weeks, and last three days. Never pregnant.

Present History.—About a year ago the patient noticed a small swelling on the outer genitals. This swelling increased steadily in size, and three months previous to her admission to the hospital ulcers were forming in the swelling. These ulcers, although absolutely painless, gradually became more extensive and severe, becoming very offensive in odor. Recently the patient has also noted the development of a rather large tumor hanging from the outer genitals between the thighs.

General Examination.—Well developed woman in good general condition. Abdomen negative. Skin, lips, mouth, throat and glands all fail to show any signs of luetic infection.

Local Examination.—(Anesthesia, because of great pain.) Introitus vaginæ scarred and unyielding and the whole surrounding tissue infiltrated. Vagina admits two fingers. The greater part of the hymen is destroyed. There is a large ulcer of hard consistency on the lower third of the posterior vaginal wall, which shows infiltrated walls covered with a dirty purulent matter. The uterus and adnexa are found to be perfectly normal.

General appearance of the vulva.—(See Table I and Figures 1, 2 and 3.) The affection of the outer genitals may be divided into two parts: namely, one large tumor originating in the right labium minus, and two marked indurative processes affecting both labia majora. The tumor of the right labium minus measures three and a quarter inches from the pedicle to its top, two and a half inches in depth, and three inches in width. This tumor is extremely hard and shows normal skin in its outer surface; whereas on its lower surface, near the pedicle, it presents deeply ulcerated areas. The left labium minus is very hard, parchment-like, sausage-shaped,

PLATE 1.

nearly two inches long, and indurated, but shows no ulcerative areas.

The right labium majus is transformed into a sausage-shaped mass three and a half inches long. Its lower portion, comprising about two-thirds of the entire labium, is markedly indurated and ulcerated. The left labium majus is similarly affected with marked ulceration in a somewhat lesser degree. This indurative process occupies also the entire perineum extending down as far as the anus, and showing several condylomata-like growths.

FIG. 1.

Rectal Examination: Anus and rectum are free from induration.

Blood Examination: Polynuclear, 72 per cent.; lymphocytes, 28 per cent.; white blood cells, 8700; red blood cells, nearly 6,000,000; hemoglobin, 90 per cent.

Wassermann Test: May 10th, +++, May 12th, ++++.

Diagnosis: Syphiloma vulvæ (edematous-indurative-ulcerative-syphilitic tumor of the vulva).

Treatment: Tumor of right labium minus removed and stump ligated with double chromcatgut. Wound properly cauterized. There was no bleeding. A large lemon-shaped piece from the right labium majus comprising the indurated areas, as well as the ulcerative mass, was then excised. Spurting vessels, which were rather numerous, were ligated and the skin stitched over with chromic cat-

gut, reinforced with silk-worm sutures. Exactly the same procedure was followed in regard to the left labium majus, only that the area excised was smaller. Before the skin was closed over, the wounds on both sides were thoroughly cauterized. (The excised parts were sent to the laboratory of the hospital for examination. I am greatly indebted to Dr. Elise L'Esperance, director of the laboratory, for the report on this case as well as the next.)

Laboratory Report: Specimen consists of (1) portion of the right labia majora, (2) portion of the left labia majora, (3) tumor mass from the left labia minora.

FIG. 2.

No. 1. Specimen from the right labium majus shows an area of skin and subcutaneous tissue measuring $6\frac{1}{2}$ by $4\frac{1}{2}$ cm. About 4×3 cm. of this portion of the labia is a deep, punched-out ulcer with hard, densely indurated, irregular edges, and a base covered with grayish necrotic material. On cross section the indurated white area is seen to extend from the base of the ulcer, for a considerable distance, into the subcutaneous tissue of the labia.

Microscopical Examination: This reveals an area of thickened epithelium and an edematous subcutaneous tissue at the edge of an ulcer. The ulcer shows superficial erosion with exudate of serum, fibrin, and polynuclear leucocytes; the base of granulation tissue

extends through to the subcutaneous tissue and approximates a wide zone of round cell infiltration, consisting of many plasma cells and lymphocytes. This infiltration radiates in strands into the deeper tissues and is associated with marked perivascular infiltration (Figs. 7 and 8).

FIG. 3.

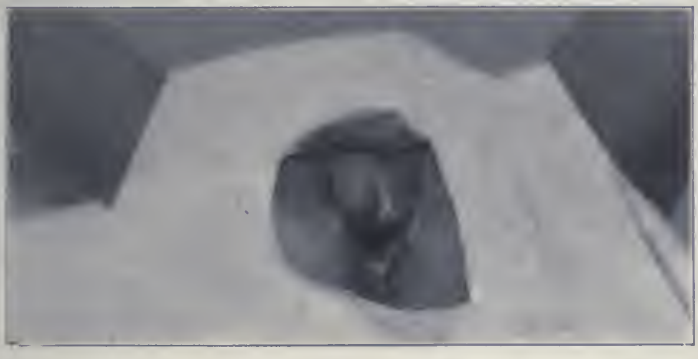


FIG. 4.

No. 2. The specimen from the left labium majus shows an ulcer $3\frac{1}{2} \times 2$ cm. with the gross characteristics of the one encountered on the right labium. The ulcer is deeper and the induration is more marked. Microscopical section reveals an histology almost identical with the ulcer on the right labium, with the exception that the perivascular infiltration is more extensive.

No. 3. Consists of an oval mass, 9 × 6¾ cm. somewhat firm, covered by thickened, dark integument. On cross section the entire area suggests edematous subcutaneous tissue with a firm covering of skin. Microscopical section reveals an intact layer of

Fig. 5.

epithelium, beneath which the loose cellular subcutaneous tissue shows edema and pale staining.

Sections of these three areas having been stained by the Levaditi method, a careful search fails to reveal spirocheta. The location of the ulcers, the indolent nature and extensive round-cell and plasma-

Fig. 6.

cell infiltration arranged in strands, associated with definite perivascular character, give strong evidence of the syphilitic nature of these lesions.

Diagnosis: Syphilitic ulcers of the labia majora. Marked subcutaneous edema of the labia minora.

During the period of convalescence the patient received bi-weekly intravenous injections of salvarsan—gram 0.6. The affected areas showed prompt improvement with rapid healing of the wound.

Case II.—J. C. Married. Colored. Twenty-two years of age. Admitted to the hospital May 19, 1919.

Family history as well as previous personal history negative. Menstruation began at 13; occurs regularly every four weeks and lasts 4 days. Last period May 11th. No miscarriages. One normal confinement.

Fig. 7.

Present History: A painless growth started in the vulvar region about two years ago and has gradually become larger, never causing pain, except for an occasional burning sensation on urination. Patient admits that several years ago her husband contracted "a cold" of the genital organs.

General Examination: General appearance healthy and well nourished. Abdomen negative. Lips, mouth, and throat negative as to luetic infection. No glands are palpable.

Examination of Blood: Normal. Wassermann Test: May 20th, ++.

Local Examination: The right labium minus is transformed into a hard indurated tumor about the size of a lemon. The tumor involves the entire right labium minus. The left labium minus shows a similar tumor of the same nature, but somewhat smaller. When the two tumors were pushed upward toward the abdomen, an ulcerative area involving the entire lower surface of both tumors, as well as that of the clitoris, is seen. The latter seems to be completely involved in the ulcerated area. (See Table II, Pictures 4, 5 and 6.)

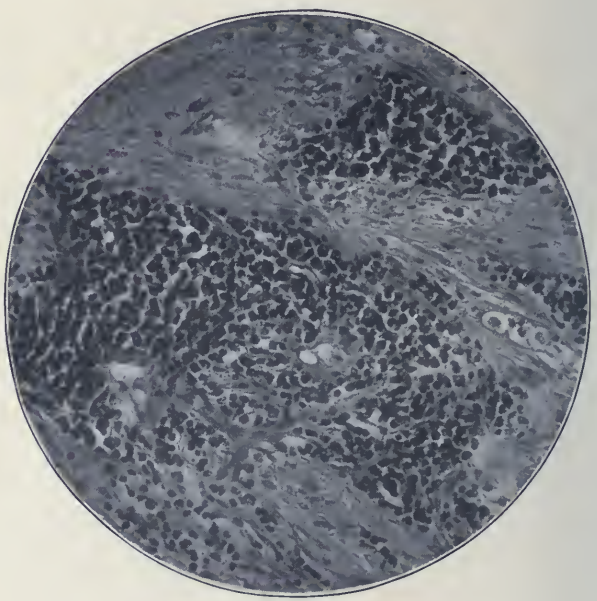


FIG. 8.

The labia majora are somewhat indurated, though not to the same extent as in the case first described. The perineum, however, has been entirely destroyed by the ulcerative process, resembling a perineal tear of the third degree. The surrounding tissue in the lower third of the posterior vaginal wall is hard, indurated, and covered with confluent ulcers having a dirty, grayish-yellow surface. The rectal wall is not involved. All the ulcers are of exactly the same type, indurated with ragged undermined edges, and bases covered with a dirty, grayish, necrotic membrane.

Diagnosis.—Syphiloma vulvæ (syphilitic, indurative, ulcerative, edematous tumors of both labia minora, and deep syphilitic ulcers of the lower third of vagina with practically entire destruction of the perineum).

Operation.—May 28, 1919. The pedicles of both tumors of the labia minora were clamped and burned off with cautery and stumps securely ligated wih double chromcatgut. The ulcerated area of the lower part of the vagina was then extensively cauterized and the vagina tightly packed with iodoform gauze. Bi-weekly intravenous injections of salvarsan, 0.6 gram, were given during her convalescence with marked improvement in the local conditions. (As in the former case, the excised parts were sent to Dr. L'Esperance, who reported as follows):

PLATE 2.

Laboratory Report.—"Specimen consists of (1) portion of right labia, and (2) scrapings from ulcers in the vagina. No. 1. consists of an area from the right labium majus measuring 5½ by 4 cm. in the distal portion of which there is an indurated ulcer 3 × 1 cm., with ragged undermined edges and base covered with a grayish necrotic membrane. Histological examination reveals a superficial erosion of the epithelium with underlying round-cell infiltration, which shows a tendency to radiate from the original focus. There is moderate perivascular infiltration extending for a considerable distance under the normal epithelium. No. 2. The small bits of material from the vaginal ulcers have no definite gross characters.

Microscopic examination reveals a deep erosion with complete destruction of the squamous epithelium, marked round-cell and plasma-cell infiltration. The histological character of these ulcers, the marked perivascular and plasma-cell infiltration, their location, and indolent course appear to warrant the diagnosis of syphilitic lesions of the labia and vagina. Material from the labia and vagina has been stained by Levaditi's method, and a careful search fails to reveal spirocheta in the tissues."

CONCLUSIONS.

1. In conformity with modern knowledge, and in the interest of a better understanding of the disease, all misleading names such as esthiomène or lupus vulvæ should be exterminated from the literature.

2. Syphiloma vulvæ correctly designates the disease as a manifestation of tertiary lues.

3. A positive Wassermann test is not essential in view of the long-standing character of the specific infection in the majority of the cases.

4. The treatment under all circumstances should consist of (*a*) Operative removal of all tumors, hypertrophied tissues, and ulcers, followed in the same session by (*b*) energetic cauterization, and combined with (*c*) intensive antisyphilitic medication.

BIBLIOGRAPHY.

1. Abraham, T. B. Later Syphilides of the Mucous Membranes. In D'Arcy Power and J. Keogh Murphy, "A System of Syphilis," vol. v, 1914, p. 156. (Oxford Medical Publications.)

2. Boulton, P. Extensive Syphilitic Disease of the Vulva. *British Med. Jrl.* li, 1883, p. 1017.

3. Darre, H. and Delaunay, P. Clinique diagnositic des ulcérations vulvaire. *Gazette des Hôpitaux*, 1904, vol. lxxvii, p. 657.

4. Duncan, J. M. On Lupus of the Pudendum. *Medical Times and Circular*, 1884, vol. ii, p. 671.

5. Dupuy, R. & Rullier, G. Remarques sur la symptomatologie et la nature du sclereme genito-ano-rectal (esthiomène de la vulve). *Revue de Gyn. et de Chir. Abdom.* 1907, vol. xi, p. 1007.

6. Fournier, A. Leçons sur la Syphilis chez la femme. Paris, 1873, p. 500.

7. Gallagher, J. F. Syphilitic Indurations of the Vulva; with Report of Four Cases. *Surg., Gyn. & Obst.*, 1919, vol. xxviii, No. 5, p. 482.

8. Gaucher and Nathan. Syphilide chancriforme de la vulve. Bullet. d. l. Soc. Franc. de Dermatol. et de Syphiligr., xix, 1908, p. 104.

9. Heller, J Ueber Esthiomene. *Acch. f. Dermatol. u. Syphil.*, 1912–13, p. 401.

10. Huguier, P. C. Mémories sur l'esthiomène de la région vulvo-anale. *Mén. de l'Acad. de Méd.*, 1849, vol. xiv, p. 501.

11. Idem. De l'esthiomène de la vulve et du perinée. *Thèse de Paris*, 1849.

12. Hyde, J. N. The Syphiloma of the Vulva. *Jrl. of Cutan. & Gen. Urin. Diseases*, 1889, vol. cii, No. 4, p. 121.

13. Kurz, Lena. Esthiomène or Lupus Vulvæ. *The Jrl. of Obst. & Gyn. of the British Empire*, 1913, vol. xxiii, p. 353.

14. Lubarsch, O. Die syphilitischen Neubildungen. Aschoff's *Pathologische Anatomie.*, 1911, 2nd edit., p. 542.

15. Morris, Malcolm. Diseases of the Skin. Edited 1917, p. 455.

16. Peckham, Grace. A Contribution to the Study of the Ulcerative Lesions of the Vulva, commonly Called Lupus or Esthiomène. Am. Jour. of Obst., 1887, vol. xx., p. 785.

17. Pozzi, L. Esthiomène de la Vulve. *Traite de Gynecologie Clinique et Opératoire*, 1907, 4th edit., p. 1288.

18. Stein, A. & Heimann, W. Esthiomène and Secondary Elephantiasis Vulvæ (Ulcus Vulvæ Indurativum Œdematosum). *Surg., Gynec. & Obst.*, 1912, vol. xiv, p. 345.

19. Taylor, I. E. On Lupus or Esthiomène of the Vulvo-Anal Region. *Gynecolog. Transactions, Phila.* 1881, vol. vi, p. 199.

20. Taylor, R. W. Chronic Inflammation, Infiltration and Ulceration of the External Genitals of Women, with a Consideration of Esthiomène or Pupus of These Parts. *N. Y. Med. Jrl.*, 1890, vol. li, p. 1.

21. Thorn, B. P. Syphilis and Malignancy. *Am. Jrl. of Syphilis*, ii, 1918, p. 40.

22. Verchere, F. La sclerome anovaginal. Revue de Gyn. et de Chir. Abdom., 1898, vol. ii, p. 1078. Bull. Soc. Franc. de Dermat. et de Syphil., 1908, xix, p. 207.

23. Vignolo-Lutato, K. Beitrag zur Kenntnis des tertiären anorektalen und vulvären Syphilids. *Dermatol. Zeitschr.*, 1914, vol. xxi, p. 501.

THE RATIONAL TREATMENT OF FIBROMYOMATA UTERI.

BY

STEPHEN E. TRACY, M. D., F. A. C. S.,

Philadelphia, Pa.

To treat fibromyomata uteri intelligently, we must consider the life history of these neoplasms; the malignancies in the uterus and appendages which co-exist; the age at which the degenerations and malignancies occur; the age at which the patients seek relief; the associate abdomino-pelvic lesions, and the results secured by surgery. We must then investigate the results of the application of *x*-ray and radium. After these factors have been considered, and the results of the various methods compared, we should then be in a position to determine the best method of treatment in the majority of cases, and what should be done with the exceptions. Only by such a study can we apply the rational treatment.

The life history of these tumors shows that many undergo degeneration of various forms, that the percentage of degenerations and malignancies increases with advancing years, and that the tumors do not disappear after the menopause. In a series of 3561 collected cases, subjected to operation, it was found that the various degenerations were present in 21 per cent. In a series of 511 cases reported by Deaver, degenerations were present in 28 per cent. In my first 100 operative cases, degenerations in the tumors were present in 20 per cent.

The age at which these degenerations occur must be considered, as it has a distinct bearing on the treatment. In a collected series of 714 cases, there were degenerations in 168. Of these, fifty-nine, or 35.11 per cent., were found in patients under the age of forty years. In 109 cases, or 64.88 per cent., the women were more than forty years of age, a condition which shows that the degenerations are nearly twice as frequent after the age of forty years.

Of even greater importance than the degenerations are the malignancies which co-exist. It is well known that this is the most serious complication of fibromyomata uteri. A careful study of fibromyomata associated with malignancy has demonstrated most

conclusively that in some way, not understood, there is an intimate relation between these tumors and carcinoma of the corpus uteri.

In a series of 3561 cases, malignancy was present in 4 per cent. In 337 cases reported by Noble, malignancy was present in 17, or 5 per cent. In the last 100 cases he reported, malignancy was present in 8 per cent. In a series of 500 operative cases, Bland Sutton found malignancies in 12.7 per cent. of the women who had attained the age of fifty years and upward. In 700 specimens examined by McDonald, malignancies were found in thirty-five, or 5 per cent. Freund, in 500 myoma cases, found carcinoma of the uterus, or ovary, in 6 per cent. Kline, in 491 cases, found malignancy in 7.7 per cent. In my first 100 operative cases, there were carcinoma of the corpus uteri, seven cases; carcinoma of the cervix uteri, two cases; carcinoma of the ovary, with secondary involvement of the uterus and sigmoid, one case; sarcoma, one case, making 11 per cent. of the cases complicated by a malignancy of the pelvic organs. In addition, there was one patient who had a carcinoma of the breast, which was removed a few days after the hysterectomy.

In a collected series of 714 operative cases, including 100 of my own, there were thirty-six malignancies. Four, or 11.11 per cent., occurred in women under the age of forty years; thirty-two, or 88.88 per cent., were in women who had reached the age of forty years or upward. In the eleven cases in my own series, 90.9 per cent. occurred in women past the age of forty years.

It is well known that cancer is on the increase, and we can expect to find a greater percentage of fibromyomata uteri associated with malignancy as time goes on. The death rate from cancer in the United States registration area increased from 62.9 per 100,000 population in 1900 to 78.9 in 1913.

These statistics should make it evident to even the most skeptical, that the malignant factor should be considered in all fibromyomata uteri which produce symptoms and require treatment. Series of cases which show a small percentage of malignancies, I believe, indicate that the specimens have not been given thorough histological study.

Thus far, we have considered the degenerations in the tumors and the malignancies in the pelvic organs separately. Fibromyomata, associated with a malignancy of the pelvic organs, if operable, should be treated by surgery and all degenerated tumors should be removed. Even the radiotherapists will agree with this. As the treatment in

both classes of cases is the same, it will, therefore, simplify matters if we study them together.

In a collected series of 714 cases, degenerations and malignancies were present in 28.57 per cent. In Deaver's 513 cases, they were found in 28.84 per cent. In my series, they were present in 31 per cent.

These figures demonstrate that of patients with fibromyomata uteri subjected to operation, 30 per cent. have either a degeneration of the tumor or a malignancy of the pelvic organs.

The age at which the degenerations and malignancies took place in 714 cases varied from twenty-three years to seventy-two years. Of the 204 cases in which these pathological changes took place, 141, or 69 per cent., occurred in women after the age of forty years. In my cases, pathological changes were present in 31 per cent. Of these, 84 per cent. occurred in women of forty years of age or upward.

Lesions of the abdomino-pelvic organs are so frequently associated with fibromyomata uteri that they must be studied carefully when considering the treatment of these neoplasms, if we wish to remove all the pathology and relieve the patient of all symptoms. Anything less than this is a makeshift, and is neither scientific nor satisfactory.

In a collected series of 3561 cases associate abdomino-pelvic lesions were present in 41.56 per cent. of the cases. Brown, in 1500 cases recorded associate lesions in 36.66 per cent. Frank, in 400 cases, found complications in 31.02 per cent. of the cases. Noble, in 337 cases, found associate lesions in 141 or 41.83 per cent. In my first 100 cases, associate conditions were found in 46 per cent. Thus, in a series of 5898 cases, associate lesions were found in 39.4 per cent., or approximately 40 per cent. of the cases.

This 40 per cent. does not represent the true situation, as it has not taken into consideration the cases of cholecystitis, cholelithiasis, and other lesions in the upper abdomen, the pathological changes in the kidneys, and the impairment of function of the gastro-intestinal tract resulting in a toxemia from pressure of large and intraligamentous tumors, or the myocardial changes which are present in a certain number of these patients. Some surgeons claim there is no relation between these neoplasms and the myocardial changes; nevertheless, we have all seen patients who were semi-invalids from cardiac disturbances restored to good health by removal of the fibromyomata. When we add to this 40.77 per cent. 30 per cent. of degenerations and malignancies, we have 70 per cent. of complicated

cases. In my series, there were 77 per cent. with complications. In Deaver's series, of 513 cases, in over 90 per cent. the appendix alone showed some pathological change.

These figures show that in only 30 per cent. of the patients do we have simple uncomplicated tumors.

As 69 per cent. of the degenerations and malignancies occur in women who have attained the age of forty years or upward, it is important to know at what age these patients apply for treatment.

In Kelly's series of 210 cases, treated by radium, 69 per cent. of the patients were forty years of age or over. In my series, 64 per cent. were forty or more years of age, an average of 66 per cent.

Of patients subjected to operation, in addition to the removal of the neoplasm, many are operated upon at the same time for lacerations, hemorrhoids, fistulæ, diseased gall-bladders, appendices, and other lesions. In spite of all the various complications, by surgery we relieved the patients of all symptoms in 96 per cent. of the cases.

In our surgical treatment, we must consider the menopausic condition. In my own cases in patients in whom the ovaries were allowed to remain, 50 per cent. had no menopausic symptoms, as compared with 18.7 per cent. of those who had the ovaries removed. Of those who had the ovaries removed, the menopausic symptoms were absent or mild in 77 per cent.

In patients past the age of forty years, I believe it makes but little difference whether the ovaries are allowed to remain, or are removed, as the menopause will soon take place, and the majority of women do not have any serious trouble. It is my impression that the artificial menopause is of shorter duration, and less severe than is the natural menopause.

The mortality from operations on patients with fibromyomata uteri by good surgeons in well equipped hospitals is about 2 per cent. These operative cases include those with the various degenerations, the densely adherent tumors, the malignancies which co-exist, and all the serious associate conditions. If the surgical mortality in all cases as they come, is only 2 per cent., in simple uncomplicated cases, it would be practically nil.

Radiotherapists, I believe, are quite agreed on the following: 1. That the best results from ray treatment are secured in women past the age of forty years; the older the patient the better the results. Under the age of forty, Pfahler states, roentgentherapy is not the method of choice. 2. That the rays should not be used: in the presence of malignancy, if the case is operable; in submucous, or large pedunculated subserous tumors; in degenerated tumors; in

tumors associated with lesions of the appendages; tumors which produce symptoms from pressure and require quick relief, and in tumors associated with pregnancy. The radium experts apply about the same conditions.

Who can diagnosticate all these conditions by any method of examination? The surgeon certainly cannot. Occasionally, the pathologist with his microscope overlooks a malignancy, and the condition is not detected until the patient returns with a recurrence. The more competent roentgenologists will not treat these patients unless they have been examined by a gynecologist or by a surgeon.

When we eliminate the patients under forty years, and the complicated cases over forty years of age, it is apparent that the field for radiotherapy is decidedly limited. Frank has estimated that the ray treatment is applicable at the most in only 5 or 6 per cent. of patients who have fibromyomata. In 100 operative cases, there were sixty-four patients past the age of forty years; of these, forty-eight were complicated, and sixteen uncomplicated, a result which meant that in my experience radiotherapy was applicable to only 16 per cent. of these patients who sought relief.

Pfahler, in a series of ninety-five myomata cases, treated by *x*-ray, was able to give the known condition in sixty-seven. Of these he reported permanent amenorrhea in 84 per cent.; disappearance of the tumors in 75 per cent., and marked reduction of the size in 10 per cent. Brettauer reported permanent amenorrhea in 78 per cent. of thirty-two cases treated by the *x*-rays. In nearly every case there was a decided diminution in the size of the uterine mass, while in some patients the tumors disappeared. As he did not state the number in which the tumors disappeared, it is evident that the percentage of absolute cures was not high. Stern, who had treated between 200 and 300 myoma cases with *x*-rays, stated that his results were about the same as those reported by Brettauer.

Radiotherapists place especial emphasis on the production of amenorrhea, which is simply the elimination of one symptom, and patients with interstitial or subserous tumors usually do not have abnormal bleeding. They talk about the shrinkage of the tumors in many cases, but most of them carefully avoid stating in what percentage the tumors disappeared. Pfahler's results probably represent about the best that can be secured by *x*-ray treatment.

Some foreigners state they cure all cases of fibromyomata uteri, except those removable by myomectomy, by *x*-ray treatment. The statement is at such variance with the facts that it needs no further consideration.

Kelly states that before a patient is treated for fibromyoma by radium, a careful, general and local examination should be made. A preliminary curettement should be done to eliminate a malignancy and to remove any polypi, and an *x*-ray examination should be made to exclude calcified tumors which are not responsive to treatment.

In his series of 210 cases treated by radium, 146, or 69.52, were forty years of age or over. He claims that sixty-six, or 45 per cent., are cured, in the sense that the tumor has either completely disappeared or shrunken to an insignificant size. In forty-eight, or 33 per cent., the tumors are markedly diminished, and the symptoms have been relieved.

Of the patients under forty years of age, there were sixty-four. Of these, in twenty-eight, or 43.7 per cent., the tumor has either disappeared or has practically gone. In sixteen, or 25 per cent., the tumor has decreased in size. In six, or 9.3 per cent., radiation was not satisfactory, and subsequently operation was performed.

In the whole series of 210 cases, the tumor had completely, or nearly disappeared in only ninety-four, or 45 per cent. of the cases; diminished in size in only sixty-four, or 30 per cent. It is regrettable that he did not state in what percentage the tumor had entirely disappeared.

Kelly reports the menopausic symptoms in 146 cases during the amenorrhea as follows: in fifty-four, or 37 per cent., no symptoms mentioned; in thirty-two, or 21 per cent., they were moderate, while in twenty-five, or 17 per cent., they were distinct and definite. These results are about the same as in the operative cases.

Clark, in the discussion on Kelly's paper, stated that he had treated over 100 cases with radium, and that his statistics were very much the same.

In the treatment of myomata by *x*-rays and radium, Schmitz reported that of fifteen cases, thirteen, or 86.6 per cent., were permanently relieved of hemorrhage, and the tumor disappeared in all but a few cases. Schmitz, in his paper entitled "The Treatment of Certain Hemorrhages of the Uterus with Radium and Roentgen Rays," states "the cancers and myomata, of course, were always extirpated if operable."

Miller and King treated twenty-six patients between twenty-nine and forty-five years of age, for fibromyomata with radium. In nearly all cases, amenorrhea was produced, and the tumor was only one-half to one-third the original size, and in some cases scarcely perceptible.

Oliva treated thirty-five patients at or near the menopause for small uterine fibromyoma, with *x*-ray and radium. In twenty-five, or 71 per cent., there was a total disappearance of the tumor.

The statistics as here presented, show that of the patients who consulted the surgeon for relief of symptoms, 30 per cent. had either a degeneration of the tumor, or a malignancy of the pelvic organs; that 69 per cent. of these pathological changes took place in women who had reached the age of forty years or upward; that nearly 90 per cent. of the malignancies were found in women past the age of forty years. Associate lesions of the abdomino-pelvic organs were found in 40 per cent. of the cases, making 70 per cent. who had pathological lesions in addition to the fibromyomata, thus leaving 30 per cent. of simple cases. As only 30 per cent. of cases are uncomplicated, and 66 per cent. are forty or more years of age, we have only 19.8 per cent. of simple cases past the age of forty years. In my cases they were 16 per cent., giving an average of 18 per cent. In other words, in only 18 per cent. of the cases who seek relief is radiotherapy applicable.

By surgical treatment we cure at least 96 per cent. of the patients of all symptoms, the tumors are gone beyond question, and in addition, other abdomino-pelvic lesions are cured. The patient is happy and the mind at rest.

The roentgenologists are agreed that patients under forty years of age are not good subjects for ray treatment. The best results I have found are those reported by Pfahler, who claims amenorrhea in 84 per cent., and disappearance of the tumor in 75 per cent. The majority of roentgenologists discuss amenorrhea, shrinkage of the tumor, and its disappearance in somes cases, but give no statistics. Their absolute cures are evidently so few that they prefer to keep them in the dark. Other roentgenologists freely admit that *x*-ray treatment for fibromyomata is a dead issue.

Amenorrhea and shrinkage of the tumor is not a cure, as no one can foretell what will happen to the tumor later on. Cases have been reported in which a malignancy developed during the ray treatment; in other cases malignancy has developed subsequent to the treatment. Pfahler advances the argument that if malignancy developed subsequent to ray treatment, the literature would contain a greater number of such reports. He and other operators do not recommend radiotherapy for fibromyomata in the presence of malignancies. Surgeons do not refer such cases, and as the radiotherapists treat only simple cases, there is but little weight to this argument.

Taking Pfahler's results, 75 per cent. of absolute cures, as probably the best that can be accomplished by Roentgen treatment, what have we? Of patients who seek relief for symptoms resulting from fibromyomata uteri and associate abdomino-pelvic lesions, only 18 per cent. of those who are past the age of forty years have simple, uncomplicated tumors. If 75 per cent. of the 18 are cured, we have a net result of only 13.5 per cent. of absolute cures; in my own cases 75 per cent. of the 16 would give 12 per cent. of cures.

In considering the results secured from treatment by radium, it will be necessary to draw our conclusions from Kelly's report, as he has had a large experience with radium, and has published the only detailed report with which I am familiar. In the patients over forty years of age, 45 per cent. were cured in the sense that the tumor has either disappeared or shrunken to an insignificant size. Thus 45 per cent. of 18, would give 8 per cent. of absolute cures.

While it is evident that radium has an extremely limited field in the treatment of fibromyomata uteri, nevertheless, with our present knowledge, it would seem that it is worthy of consideration in simple, uncomplicated neoplasms, in patients at or approaching the menopause. Even in this limited class of cases, the crux of the situation is in the diagnosis. What is considered a simple case proves frequently to be a complicated one. The difficulty in the use of radium, even in its limited field, is the proper selection of cases. Clark, who has taken a conservative position, and has emphasized the limitation of radium, reported that in 137 cases, 8, or approximately 6 per cent., subsequently required operation.

I believe, however, that radiotherapy, radium, and *x*-rays may be employed with advantage in the treatment of these tumors as follows: (*a*) in a patient whose general health is so impaired, from any cause, that she could not survive an operation; (*b*) in cases of marked anemia to control bleeding temporarily, until the patient is sufficiently restored to undergo an operation; and (*c*) in a patient who has metrorrhagia after a myomectomy, and in whom an histological examination of the tumor and endometrium show no evidence of a malignancy.

If radiotherapy be used subsequent to operation, in those patients in whom a malignancy co-existed, the results will probably be more favorable than if surgery alone be employed.

When we recall that 70 per cent. of the cases of fibromyomata uteri are complicated; that of the patients subjected to operation, in addition to the removal of the tumor, 96 per cent. are cured of the symptoms resulting from the associate abdomino-pelvic lesions,

while in the same class of cases, radiotherapy will give only 8 to 12 per cent. absolute cures, it would seem that the rational treatment in such cases, with the few exceptions mentioned, is early surgery.

REFERENCES.

Tracy, Stephen E. *Surgery, Gynecology and Obstetrics*, March, 1908, pp. 246–254.

Tracy, Stephen E. *Journal American Medical Association*, vol. lxvii, pp. 1213–1216; Oct. 21, 1916.

Noble, Charles P. *Journal Obstetrics and Gynecology, British Empire*, 1906, x, p. 436.

Bland-Sutton, Sir John, London, 1913.

McDonald, Ellice, *Journal Amer. Med. Association*, vol. xlii, No. 1, pp. 1344–1349, May 21, 1904.

Freund. Quoted by Nordentoft Panner and Kjaergaard; Obst. *Journal Amer. Med. Association*, Aug. 22, 1914, p. 714.

Kline Quoted by Nordentoft, Panner and Kjaergaard. *Journal Amer. Med. Association*, Aug. 22, 1914, p. 714.

Deaver, John B. *Journal Amer. Med. Association*, vol. lxvii, Oct. 21, 1916, pp. 1216–1218.

Broun, LeRoy. Amer. Journal of Obstetrics, vol. lxviii, Sept., 1918, pp. 410–415.

Frank, Robert T. Amer. Journal of Obstetrics, vol. lxxii, Sept., 1918, pp. 408–414.

Pfahler, Geo. E. *Journal of the Michigan State Med. Society*, Aug., 1918.

Brettauer, Joseph. Amer. Journal of Obstetrics, vol. lxxviii, pp. 415–423, Sept., 1918.

Stern, Samuel. Amer. Journal of Obstetrics, vol. lxviii, p. 448, Sept., 1918.

Kelly, Howard A. *Surgery, Gynecology and Obstetrics*, vol. xxvii, pp. 402–409.

Clark, John G. Amer. Journal of Obstetrics, vol. lxxviii, p. 449, Sept., 1918.

Miller, C. J. and King, E. L. *Southern Med. Journal*, 1918, vol. xi, p. 449. *Abst. Int. Abst. Surgery*, Oct., 1918, p. 338.

Schmitz, H. *Medicine and Surgery*, 1918, vol. ii, p. 714. Abst. *Int. Abst. Surgery*, Jan., 1919, p. 73–74.

Oliva, L. A. *Int. Surgery*, Oct., 1918, p. 338.

Clark, John G. Meeting of American Medical Association, 1919.

PLATE I

JULIUS H. JACOBSON, M.D.

BORN, JULY 17, 1879 DIED, DEC. 11, 1918

IN MEMORIAM.

JULIUS H. JACOBSON, M.D.

BY

DR. CHARLES W. MOOTS.

Toledo, Ohio.

Once again it has become our duty to offer a word of eulogy to the memory of a colleague whom death has claimed since we were last assembled.

In the instance of those to whom it has been permitted to carry their labors to full fruition, during along life of achievement, our regret is softened by the knowledge that time and years have smiled upon them. But our sadness is made doubly so on account of the fact that we are forced to pause and pay tribute to the memory of one whom it has pleased time to grant less than two-scoure years in which to crowd a life with successful service and achievements.

Julius H. Jacobson was born in Toledo on July 17, 1879. He died in New York City on December 11, 1918, aged thirty-nine years, four months and twenty-four days.

He was of modest parentage, his chief heritage being the impelling force of a keen ambition to do something worthy, and an extraordinary early recognition of the fact that his desires must be attained single-handed and by his own efforts. Having, thus, the good fortune of being dependent upon himself, he experienced none of the inconveniences and diverting influences that wealth so frequently brings. He was, therefore, unhampered in devoting his energies toward obtaining a practical as well as theoretical education. His fidelity to his task and the success of his early resolutions are abundantly proved by the fact that he received his degree in medicine, graduating from the Toledo Medical College in 1897, before he had reached his eighteenth birthday. Even at this early age, he had caught the vision of a great service, and went immediately to fbreign medial centers for further study that he might be fully equipped for his work. Upon his return from European universities, he lo[illegible] in his native city, which was to remain the scene of his

activities during his professional career; and here he proved the exception to a certain proverb, for his immediate and constantly increasing success bore certain testimony to the fact of a willing and justifiable recognition of real worth.

Thorough devotion to his profession did not narrow his interest in other lines, for his interest in the better class of music was keen, and he gave unsparingly of his time and means to the advancement of art.

In his home, and away from his home, he was always the ideal husband and father. Those of us who have spent the ever-pleasant evening in his home wonder most why he was called so early, for his presence was always inspiring. He had the poise of one whose confidence in himself rested on the firm basis of true scholarship and ability.

Dr. Jacobson has always been identified with organized effort to better the profession. At the early age of twenty-four, he was elected the first president of the Academy of Medicine of Toledo and Lucas County, a society which was the result of merging the two organizations formerly existing in Lucas County. At the same time he was elected by the Ohio State Medical Association to serve as its first councillor for the fourth district, which comprises ten counties in Northwestern Ohio. He served in this capacity for three terms, or a total of six years.

The doctor was also an active member of the Northerwestern Tri-State Medical Association, American Medical Association, American Urological Association, American Association of Obstetricians and Gynecologists, and a Fellow of the American College of Surgeons.

That his exemplary life and professional attainments were duly appreciated by the laity of his city, as well as by the profession throughout the land, was shown by an editorial appearing in one of the daily papers of Toledo, from which I beg to quote the following:

"What is a man worth? Now how much money is he worth. Not how much land, how many buildings and bonds, how much stock or other material wealth he owns; but it is the worth of the man himself to humanity. The material evidences of wealth indicate what he has taken out of humanity's common fund, and we say he is worth a thousand, and a hundred thousand, or a million dollars.

But man's real worth is not what he *takes* for himself, but what he *gives*—what he gives in service, not dollars. We have measured man's worth too long by the false standard. We have fooled ourselves, but we have never for an instant fooled God."

I have in mind as I write one of the richest men in Toledo, yet I do not know whether he left one thousand or one hundred thousand dollars behind when he died. What he was worth to himself I do not know. It does not matter. But he was worth more than millions of dollars to this community. . . . His riches that we shall miss were not material. They were riches of the mind, the senses, the soul, expended in service. . . . This article is not written merely as a tribute to Dr. Jacobson, nor is it written under the influence of emotion aroused by the loss of a personal friend. It is written rather in the hope that others may see the great value to themselves of service, and that they may measure more accurately the value of real worth in real men. There is inspiration, too, for the young men in the knowledge that there is no royal road to fame, but that the highest distinction awaits him who earns it through service.

What was Julius Jacobson's nationality? No matter. What was his religious belief? No matter. Where was he born? No matter. How much was he worth? No matter. What was he? He was a *man*, a real *man*, a teacher, a lover of his fellow man, a servant of humanity, a master in the profession of *service*.

TRIBUTE TO DR. JULIUS H. JACOBSON OF THE AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS.*

BY

DR. E. GUSTAV ZINKE,

Cincinnati, Ohio.

THE news of the death of our young and highly respected fellow practitioner was not a mere surprise to all who knew him—it came as a violent and overwhelming shock from which his family and his friends will be slow to recover.

Julius H. Jacobson, M. D., F. A. C. S., Professor of Gynecology and Clinical Surgery in the Medical Department of Toledo University, was one of the most active and most highly respected Fellows of the American Association of Obstetricians and Gynecologists. As secretary of this Association, I feel it my duty to be present on this solemn occasion to pay tribute to the memory of our young and distinguished friend and co-worker in the profession established for the relief of suffering mankind.

Dr. Jacobson had just matured to full manhood, an age when most men begin to feel that they have just finished the preparatory stage of life's work. Dr. Jacobson, however, was much farther advanced. For the past ten years his name and fame had extended far beyond the limits of Toledo and of the State of Ohio; and when death unexpectedly deprived us of his valuable presence, he was standing at the entrance to a vast and bright area of splendid activity of service to humanity, and of the restoration to health, happiness and usefulness of those threatened with permanent invalidism or, possibly, an untimely death.

We, the Fellows of the American Association of Obstetricians and Gynecologists, looked upon Dr. Jacobson as one of our most

* Delivered at the unveiling of a Memorial Tablet of Dr. Jackson at St. Vincent's Hospital, Toledo, Ohio.

brilliant colleagues, and as one of the most promising of our younger members. We consider his death a distinct loss to us and to humanity in general.

But, as good and brave men, we submit to the inevitable, and resignedly bow to the dictates of divine Providence. We deeply mourn his loss. We shall honor his memory and sweetly cherish his true Fellowship. By placing this tablet to his memory you have honored not only the departed, but yourselves, and all who knew him.

IN MEMORIAM.

JOHN ALEXANDER LYONS, M. D., F. A. C. S.

BY

E. GUSTAV ZINKE, M. D., F. A. C. S.,

Cincinnati, Ohio.

Dr. John Alexander Lyons senior member of this Association, passed away on February 18, 1919 He was suddenly taken ill and after a careful examinaton of his case, a diagnosis of appendicitis was made. At the operation a ruptured appendix was found, and this, complicated by a weak heart, caused the doctor's death.

Dr. Lyons was born in Belfast, Ireland, in 1851, and emigrated early to this country. In 1880, he was married to Miss Chrystine Elnore Eberwein of Beardstown, Illinois. He began to study medicine in 1886, and was graduated from the Long Island Medical College of Brooklyn, New York, in 1889. In the same year of his graduation he opened his professional career in Chicago, where he remained until his death. Dr. Lyons was a devoted husband, and a trusted physician and surgeon. He will greatly be missed by all who knew him.

In 1896, Dr. Lyons was elected to active fellowship in this Association; in 1915, he was made senior fellow. He held the positions of instructor in gynecology tin he Post-Graduate Medical School, Chicago, Illinois; and that of gynecologist and lecturer to nurses in the Chicago Hospital. He was a fellow of the American College of Surgeons, the Chicago Gynecological Society, the Physician's Club of Chicago, the American Medical Association, and the Chicago Medical Society.

PLATE II

JOHN ALEXANDER LYONS, M.D., F.A.C.S.

BORN, 1851. DIED, 1919

PLATE III

AUGUST ADRIAN STRASSER

BORN, JAN. 11, 1874 DIED, NOV. 29, 1918

IN MEMORIAM.

DR. AUGUST ADRIAN STRASSER.

BY

CHARLES L. ILL, M. D.,

Newark, New Jersey.

Dr. August Adrian Strasser had been intimately associated with me for sixteen years at St. Michael's Hospital, Newark, New Jersey. I always found him a conscientious, painstaking, skilful worker, and a very good friend.

In the beginning of his practice his leaning was toward pediatrics, but later on he was attracted to surgery and he made this his specialty. Not only mechanically, but aslo pathologically, was he proficient in surgery, and his knowledge of anatomy and physiology was extensive.

Dr. Strasser had not been in good health for several years, and the hard gruelling work while at Fort Oglethorpe did much to hasten his end. Because of his failing health, he was placed on the inactive list. Dr. Strasser was intensely patriotic, sacrificing a large practice to enter the service as a first lieutenant, a rank far below his worth, soon after we entered the war. He died of apoplexy, at my home, on November 29, 1918.

Dr. Strasser was born on January 11, 1874, at Jersey City, New Jersey. He was the son of John Strasser and Emma Binder, both of whom were born in Germany. He graduated from the Jersey City Grammar School, 1886; the Jersey City High School, 1891; and from New York University, 1893. He received his medical degree at the College of Physicians and Surgeons, Columbia University, 1896. He served as intern in St. John's Riverside Hospital, Yonkers, New York, and subsequently practised medicine at Arlington, New Jersey, until his death.

In 1898, he married Miss Harriet Claus, who, with one son John A. Strasser, aged fourteen years, survives him. He was a member and ex-president of the Hudson County Medical Society, a member

of the publication committee of the New Jersey State Medical Society, ex-president of the Academy of Medicine of Northern New Jersey, and a trustee of the latter at the time of his death. He was also ex-president of the Pathological Society, and of the Physicians' Club, and trustee of the Society for the relief of Widows and Orphans of the Medical Society of New Jersey. He was a fellow of the American Medical Association, of the American Association of Obstetricians and Gynecologists, and of the American College of Surgeons. He was also a member of the Deutsche Medicinische Gesellschaft of New York, and an associate fellow of the New York Academy of Medicine. He was medical director of the Stumpf Memorial Hospital, Arlington, New Jersey.

The following is a list of Dr. Strasser's contributions to medical literature:

1. Infantile Typhoid Fever.
2. A Rare Case of Patent Diverticulum Ilei.
3. Masturbation in Childhood.
4. A Study of Metabolism in a Case Conjoining Myxedema and Diabetes Mellitus.
5. A Clinical Study of Chorea.
6. Duct Papilloma; Papillary Cystadenoma of the Breast.
7. Case of Suture of the Ulnar Nerve.
8. A Case of Vincent's Angina.
9. Non Occides.
10. The Clinical and Pathological Features of Chorioepithelioma Malignum.
11. Prolapsus Uteri.
12. Radiography as an Aid to the Surgeon.

INDEX

Abscess of the liver, 324
Advantages of nitrous oxid-oxygen in labor, 69

Bacon, Joseph Barnes, xxxiii
Bainbridge, William Seaman, xxxiii, 5, 34, 301, 316, 322, 358
Balwin, James Farchild, xxxiii, 108
Bandler, Samuel Wyllis, xxxiii
Barrett, Channing W., xxxiii
Baughman, Greer, xxxiii
Bell, John, Norval, xxxiv, 39, 122, 284, 288, 289, 320
Bill, Arthur Holbrook, xxxiv, 105, 145, 150
Bonifield, Charles Lybrand, xxxiv
Bosher, Lewis C., xxxiv
Boyd, James Peter, xxxiv
Branham, Joseph H., xxxv
Brown, George Van Amber, xxxv, 28,
Brown, William Mortimer, xxxv
Buettner, J. J., 45
Burckhardt, Louis, xxxv, 107
Buried loop operation for shortening the round ligaments, 284
Buteau, Samuel H., xxxv

Cancer in women, 365
Cancer significance of mammary adenoma 360
Care of the bowels during the puerperal period, 101
Carstens, J. Henry, xxxv, 33, 120, 160, 163, 381
Case reports, 224
Causal relationship of myomata to carcinomata of the corpus uteri, 388
Cesarean section; its indications and technic, 171
Chandler George Fletcher, xxxv, 38, 278
Chronic oophoritis and the cystic ovary, 218
Clark, Edmund Dougan, xxxv
Clinical facts concerning the stem-pessary, 290
Congenital absence of the gall-bladder, 386
Control of veneral disease in detention homes for women, 7
Crile, George W., xxxvi, 296, 300, 330, 357, 358
Crossen, Harry Sturgeon, xxxvi
Crotti, Anré, xxxvi, 365
Cystic ovary, the, 211

Darnall, William Edgar, xxxvi, 281, 318, 323
Davis, Asa Barnes, xxxvi, 85, 109, 149, 180
Davis, James Ethelbert, xxxvi, 108, 170, 210, 229, 243, 282
Davis John D. S., xxxvi, 333

Detention and treatment of infected women as a measure of control of venereal diseases, 27
Dice, William Gordon, xxxvii
Dickinson, Gordon K., xxxvii, 81, 142, 288, 294, 300, 316, 336
Draper, W. F., 27, 43

Early case of adenomyoma of the rectovaginal septum, 231
Eclampsia: is it preventable?, 395
Elbrecht, Oscar H., xxxvii
Erdmann, John Frederick, xxxvii, 1, 321, 322

Farr, R. E., 52, 81, 84
Findley, Palmer, xxxvii, 7, 40
Foster, Curtis Smiley, xxxvii
Frank, Louis, xxxvii
Furniss, Henry Dawson, xxxvii

Gillespie, William, 161
Gillette, William J., xxxviii
Goldspohn Albert, xxxviii, 32, 121, 127, 226, 286
Goodman, Sylvester Jacob, xxxviii, 92, 110, 170

Hadden, David, xxxviii, 143
Haggard, William David, Jr., xxxviii
Hall, Joseph Arda, xxxviii, 358
Hall, Rufus Bartlett, xxxviii, 287, 289, 294, 321
Hamilton, Charles Sumner, xxxix
Harrar, James Aitken, xxxix, 117, 126, 157
Hayd, Herman Emil, xxxix
Hedges, Ellis W., xxxix
Hewitt, Herbert Windham, xxxix, 388
Hill, Ira Leon, xxxix
Hot flashes of menopause, 182
Huggins, Raleigh Russell, xxxix
Huniston, William Henry, xxxix

Ill, Charles L., xl, 447
Ill, Edward Joseph, xl, 120
Incidence of malignancy in diseases of the gall bladder, 1
Inversions of the uterus, 164

Jacobson, Julius H. In memoriam, 441, 444
Jonas, Ernst, xl
Jones, Arthur Thoms, xl, 224, 288

Keefe, John William, xl, 35, 320, 324
Kennedy, James W., xl
King, James, E., xli, 228
King, W. F., 30
Kirchner, Walter, C. G., xli
Kosmak George William, xli

Langfitt, William Sterling, xli
Leighton, Adam P., Jr., xli
Litzenberg, Jennings, xli
Longyear, Howard Williams, xli
Lothrop, Earl P., xlii
Lynch, Jerome Morley, xlii
Lyons, John Alexander. In memoriam, 446

McClellan Benjamin Rush, xlii
McKesson, E. I., 60
McLaughlin, A. J., 21, 42
McPherson, Ross, xlii, 36, 101, 111, 124, 150
Manton, Walter Porter, xlii
Marvel, Emery, xliii
Median episiotomy in primiparous labors, 117
Meeker, Harold Denman, xliii
Method of placing sutures in repair of the perineum, 113
Miller, Aaron Benjamin, xliii, 299
Miller, John D., xliii, 37
Moots, Charles W., xliii, 60, 441
Moriarta, Douglas C., xliii, 40
Morris, Lewis Coleman, xliii
Morris Robert Tuttle, xliv, 229, 298, 346, 348
Mosher, George Clark, xliv
Myenteric nerve net, the, 336
My experience with cases of version during the past year, 152

Noble, George Henry, xliv
Noble, Thomas Benjamin, xliv, 6, 321

Observations on the problem of hemorrhage in obstetrical cases, 145
Olmsted, Ingersoll, xliv

Pantzer, Hugo Otto, xliv, 39, 107, 226, 322, 331
Peck, George Augustus, xliv
Percy, James Fulton, xlv
Pfaff, Orange G., xlv
Pierce, C. C., 9
Pioneering in venereal disease control, 21
Porter, Miles, F., xlv, 39, 125, 299, 322, 372
Porter, William D., xlv, 113, 161
Postoperative analgesia, 76
Potter, Irving White, xlv, 104, 150, 152, 163, 178
Poucher, John Wilson, xlv, 179
Prenatal care, 92
Prophylaxis of gestation, 85
Protective changes in the oviduct, 243

Quigley, James Knight, xlv, 395

Rational treatment of fibromyomata uteri, 432
Reder, Francis, xlv, 33, 123, 211, 230
Reed, Charles Alfred Lee, xlv, 314

Repair of partial and complete lacerations of the perineum, 127
Rongy, Abraham Jacob, xlvi, 149, 159, 170, 179, 227, 287
Rosenthal, Maurice I., xlvi
Runyan, Joseph Phineas, xlvi
Ruth, Charles Edward, xlvi

Sadlier, James Edgar, xlvi
Safety factors in the team work of operator and anesthetist, 45
Sanes, Kay Isadore, xlvi, 182, 228, 294, 347
Schildecker, Charles Bushfield, xlvi
Schwarz, Henry, xlvi
Schwarz, Otto, xlvii, 218, 231
Scott, N. Stone, xlvii
Sellman, William Alfred Belt, xlvii
Short incisions versus long incisions, 346
Simpson, Frank Farrow, xlvii
Skeel, Arthur Julius, xlvii, 104, 122, 158, 171
Skeel, Roland Edward, xlvii, 321, 349, 358, 379
Smead, Lewis Frederick xlvii
Some adjuncts which promote efficiency in use of local anesthesia, 52
Some lessons from the war for abdominal surgeons and others, 349
Stark, Sigmar, xlvii
Stein, Arthur, xlviii, 413
Stewart, Douglas Hunt, xlviii
Stillwagen, Charles A., xlviii
Strasser, August Adrian. In memoriam, 447
Study of certain bands in the right upper abdominal quadrant, 301
Surgical barrage, 60
Sutton, Henry Thomas, 122
Swope, Lorenzo, W., xlviii
Syphilis as a cause of delayed healing in the non-infected abdominal incision, 318
Syphiloma vulvæ, 413

Tate, Magnus, Alfred, xlviii, 160
Torrance, Gaston, xlviii, 386
Tovey, David William, xlviii
Tracy, Stephen E., xlviii, 432
Treatment of gunshot wounds of the abdomen, 333
Treatment of peritonitis, 296
Treatment of vaginal dishcarge, 279
Tumors of the breast, 372
Turner, C. E., 69

Value of detention as a reconstruction measure, 9
Vander Veer, Albert, xlviii
Vaner Veer, Edgar Albert, xlix
Van Hoosen, Bertha, 76, 83, 84, 379
Van Sweringen, Budd, xlix
Varieties and treatment of dysmenorrhea, 381

Wade, Henry Albert, xlix
Waldo, Ralph, xlix

Walker, Edwin, xlix
Weiss, Edward Aloysius, xlix, 106
Welton, Thurston Scott, l, 290, 294
Werder, X. O., 142
West, James Nephew, l
Westmoreland, Willis Foreman, l
Wetherell, Frederick S., 331, 357
White, George R., l
White, H. F., 41
Wing, Lucius Arthur, l

Yates, H. Wellington, l, 36, 106, 164, 170, 282

Ziegler, Charles Edward, l
Zinke, Ernst Gustav, li, 162, 444, 446

(17)
673 -4.

BINDING SECT. MAR 31 1900

RG
1
A4
v.32

American Association of
Obstetricians, Gynecolog
and Abdominal Surgeons
Transactions

Biological
& Medical
Serials

PLEASE DO NOT REMOVE
CARDS OR SLIPS FROM THIS POCKET

UNIVERSITY OF TORONTO LIBRARY

STORAGE